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FEEBLE-MINDEDNESS AND HEREDITY

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1. THE NATURE AND THE CLASSIFICATION OF FEEBLE-MINDEDNESS

Feeble-mindedness may be defined as a phenomenon of imperfect and arrested mental development. When we say a person is feeble-minded, we mean that his mental power has failed to reach its normal development; he lacks something in his mental make-up; and he can not learn even though he is placed in a very favorable environment. He may not have any physical stigmata of degeneration. Indeed, his body may be just as strong and healthy as any normal person, but his mind is essentially that of a child. Common school has no place for him, because he can not profit by its instruction. He may be made to earn his own living by manual labor under very favorable circumstances, but he can not be made to compete with the normal individuals on equal terms, or to manage himself or his own affairs with ordinary prudence. He lacks the power of self-control and the intuitive sense of morality. He is not immoral but non-moral. His animal instinct can always have a free play whenever there is a chance. He can not distinguish between what is right and wrong and is incapable of weighing the consequences of his action. In other words, his mental power stops at a given stage of its development and no educational agencies can help him to develop it any further. Physically he is a man, but mentally he is a child.

It should be understood that there is a great distinction between feeble-mindedness and insanity, although the outward manifestations in both cases sometimes appear to be similar to the untrained observer. Insanity is a clinical manifestation of intellectual and emotional disorders, the victim of which not only stops where he is in his mental development, but has lost a part of what he once had. Feeble-mindedness is a state of permanent impairment of the intellectual faculties which have not attained and can never be expected to attain a higher stage of development. As Dr. Esquiral has ably pointed out; "An insane man is deprived of advantages which he formerly enjoyed. He is a rich man, who has become poor. The idiot, on the contrary, has always been in a state of want and misery." Furthermore, insanity is a mental disease and can be cured through proper medical treatment and care, if it is not of progressive dementia type. Feeble-mindedness is incurable, because medical science can not add to the mental treasury anything which it does not possess. Dr. Barr and others think that there are some cases where feeble-mindedness may be accompanied by insanity, like dementia praecox, but there is not sufficient evidence to show that there is a causal relationship between them. They may be concomitant to each other, but they are different in kind and origin, and should not be treated alike.

I should also like to call your attention to the fact that the term "feeble-mindedness" has been used both in a specific and in a generic sense. Specifically it is used to designate the milder form of mental defect. In England the whole group of mental defects is called mental deficiency, or amentia. The various degrees of amentia are called idiots, imbeciles, and the feeble-minded. In America we use feeble-mindedness in its generic sense, and we call the different degrees of feeble-mindedness, idiots, imbeciles, and morons. Moron is derived from a Greek word meaning "a fool"—a person who lacks judgment and good sense. It designates exactly what is meant by "feeble-minded" in England.

In identifying and grading feeble-mindedness we have two different criteria for the basis of our classification. One is based on the different degrees of social and industrial inefficiency, and the other on the different mental age which can be roughly obtained by the application of Binet-Simon Intelligence tests.

Dr. Tredgold, an English medical expert for the feeble-minded, has defined amentia as "a state of restricted potentiality for, or arrest of, cerebral development, in consequence of which the person affected is incapable at maturity of so adapt-

ing himself to his environment or to the requirements of the community as to maintain existence independently of external support." [1] This definition is essentially a social one. His main contention is that every normal child possesses an amount of potentiality for mental development which is far above that possessed by the mental defective. Given the same kind of environment and the same amount of training, the normal child will be able to learn to adapt himself to the particular society he is in, while the mental defective will be incapable of maintaining himself without outside help. The difference between them does not lie in the kind or amount of training they receive, but in their ability to respond to training. Endowment makes what one is, and the product of the environment varies in accordance with the original nature upon which it operates.

The objections to this kind of definition are two-fold. In the first place, the majority of the high grade mental defectives may be classified as normal according to this definition. We have no definite idea of what constitutes an inability of adaptation, or at least we have no standard of measurement on which we can base our judgment. High-grade mental defectives may sometimes escape our recognition, because they usually have no physical stigmata of degeneration, can read and write to a certain extent, and can do some kind of manual labor under supervision with a fair degree of success. Even though they fail to earn their own living on account of their low grade of mentality, we are rather inclined to attribute their failure to the lack of opportunity and to the injustice of our social and industrial system rather than to their incapability of being taught to do so.

In the second place, social adaptation is a relative term, as Binet has pointed out that a given degree of intelligence which is sufficient for the French peasant out in the country may not be sufficient for a Frenchman in Paris. It is quite obvious that the more complex society one is in, the higher degree of intelligence is required for him to adapt himself to his environment. The same kind of intelligence which enabled one to have a successful career in the primitive and simple community may not be enough to function properly in the complicated society of today. If Tredgold emphasizes the word "incapable" in his definition, he has failed to provide us a standard or norm by which the inability of social adaptation can be measured and compared. How can we be sure that different investigators use the word "incapable," in describing the social inefficiency of the mental defectives in dif-

[1] A. F. Tredgold—Mental Deficiency. p. 8.

ferent places or in different countries, with just the same meaning? We can, indeed, be sure that they do not.

In connection with the discussion of Tredgold's definition I may also mention the definitions of the three grades of mental deficiency adopted by the Mental Deficiency Act of 1913 in England. They are as follows.

The feeble-minded are "persons in whose case there exist from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others, or, in the case of children, that they, by reason of such defectiveness, appear to be permanently incapable of receiving proper benefit from instruction in ordinary schools."

Imbeciles are "persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves or their affairs, or, in the case of children, of being taught to do so."

Idiots are "persons so deeply defective in mind from birth, or from an early age, as to be unable to guard themselves against common physical dangers."

Since these definitions are based on social criteria, they are subject to the same objections as I have mentioned above. But there is one thing more which I must mention, that is, I fail to see the difference between the feeble-minded and the imbeciles according to these definitions. Tredgold defined an imbecile as "one who, by reason of mental defect existing from birth, or from an early age, is incapable of earning his own living, but is capable of guarding himself against common physical dangers." This is a comparatively better definition than that adopted by the English Parliament, if we want the distinction between an imbecile and a feeble-minded to be sufficiently clear.

Enough has been said about the social definitions of the mental defectives. Now let us turn our attention to the psychological definitions as adopted by the American psychologists. Since the publication of the Binet-Simon Measuring Scale of Intelligence, the American Association for the Study of the Feeble-Minded has adopted a new method of identifying and grading the phenomena of mental deficiency. The terms idiots, imbeciles, and morons, are used in a very specific and well-defined sense. "Idiots" is used to designate those of mental age up to and including two years; "imbeciles," those of mental age from three to seven years; "morons," those of mental age from seven to twelve years.

It seems to me that the value of these definitions is quite obvious in spite of the limitations of the Binet Intelligence Scale. In the first place, they offer us a quantitative knowledge of the different degrees of feeble-mindedness. We have some standard to go by. We no longer depend upon our personal judgment for our classification. In the second place, they extend our conception of feeble-mindedness to include milder degrees of defect than have generally been associated with this term. Before the development of psychological tests, the high-grade defectives had often been over-looked. Those whose mental development comes only to the level of intelligence between ten and twelve years were often considered as normal by the earlier method of diagnosis. Dr. Terman says: "It is safe to predict that in the near future, intelligence tests will bring tens of thousands of these high-grade defectives under the surveillance and protection of society. This will ultimately result in curtailing the reproduction of feeble-mindedness and in the elimination of an enormous amount of crime, pauperism, and industrial inefficiency. It is hardly necessary to emphasize that the high-grade cases, of the type now so frequently over-looked, are precisely the ones whose guardianship it is most important for the State to assume." [2]

The chief objection raised by some workers in this field concerning the application of Binet Intelligence Scale for the study of feeble-mindedness is that the reliability of grading intellectual growth in terms of years is very questionable, because a year's growth is a very different thing at different periods of life. Here I may quote Mr. Cyril Burt's discussion of Binet hypothesis in a paper published in the Eugenics Review. (Vol. V, p. 364)

"Except for rough and popular purpose, any measurement of mental capacity in terms of age is unsatisfactory. Who would measure height and weight in terms of years? The unit fluctuates in its significance all along the scale. When the child is just beginning to walk and talk, when he is 7 or 8, when he is 10 or 11, when he is on the verge of puberty—at these different periods a retardation of a single year means very different things."

This objection is both psychologically and logically sound. There is a great difference between a ten-year-old who is retarded one year and a five-year-old who is retarded by the same amount. The retardation of one year for a ten-year-old is simply an indication of a little backwardness; while for the five-year-old it is a matter of great concern. To meet this objection Dr. Terman has devised a new method for grading

[2] Terman, L. M.—Measurement of Intelligence, p. 6-7.

the different degrees of mentality. This is the Intelligence Quotient which is the result of dividing the mental age by the chronological age. For instance, a ten-year-old has ten years intelligence, his I. Q. is 100; 9 years, 90; 11 years, 110, and so on. Those whose I. Q. is below 70 are definitely feeble-minded. Those whose I. Q. is between 50 and 70 are classified as morons; between 25 and 50, imbeciles; and below 25, idiots. In other words, this method enables us to state the grades of feeble-mindedness in definite numerical terms.

However, this method may be further improved, if we divide the mental age by the physiological age based on physical examination. Since children of the same chronological age differ widely in their physical development with which their intellectual growth is closely connected, our study of the feeble-minded will be much more accurate, if we base our calculation of their mental age upon their actual physiological development.

By way of summary for this section I may say that the psychological definitions of the various degrees of mental defectives are much more practical and scientific than those social definitions used in the Mental Deficiency Act in England, wooden and mechanical though they may seem. By the application of psychological tests, the feeble-minded can be easily recognized and graded as to the mental status to which they properly belong.

2. The Causes of Feeble-mindedness

In dealing with the causes of feeble-mindedness there are two possibilities we should take into consideration,—the influence of environment and the influence of heredity. Numerous investigations have been made in the last decade with regard to the relative importance of these two factors. They differ widely in their method of collecting and interpreting data, and consequently there is a great discrepancy in their results. But it has been generally agreed by all those who have studied this question that the most frequent proximate cause of feeble-mindedness is morbid heredity.

Dr. Tredgold has divided feeble-mindedness into two types, primary amentia and secondary amentia. The former is due to morbid heredity or germinal impairment, as he calls it, and the latter is due to somatic modification caused by external factors after conception has taken place. The factors which he considered as indicative of, or producing, a variation in the germ plasm are (1) neuopathic inheritance, (2) alcoholism, (3) tuberculosis, (4) syphilis, (5) consanguinity, and (6) age of parents. The factors for somatic modification are (1)

abnormal conditions of the mother during pregnancy, (2) difficulty at birth, (3) primogeniture, (4) premature birth, (5) traumatic shocks, (6) diseases, (7) convulsion, and (8) bad nutrition. From hundreds of cases he studied in the clinics in England he declared that from 85 to 90 per cent of the mental defectives were due to intrinsic causes or morbid heredity, and the rest were probably due to extrinsic causes which produces somatic modification.

With regard to the influence of the adverse conditions of environment upon mental development, he thinks that only a small percentage of the milder degrees of feeble-mindedness can be explained on this ground. Thus he says; "With regard to the influence of slum life and all its associated conditions in producing amentia, it is necessary to sound a note of warning. It does happen sometimes that the real mental defectives of our large towns hail from the slums, although I do not think such is disproportionately the case. Still, a sufficient number of defective children come from such areas to make the superficial inquirer, content with that which is apparent, jump to the conclusion that the pernicious environment is therefore the cause of their defect. My own inquiries have convinced me that in the great majority of these slum cases there is a pronounced morbid inheritance, and that their environment is not the cause, but the result, of that heredity. The neuropath is one who is at an economic disadvantage in the struggle for existence. He frequently finds it difficult to hold his place, and he is often possessed of careless, improvident, and intemperate propensities, which cause him to fritter away the money he does earn. He is on the downgrade. No wonder, then, that he drifts to the slums." [3]

Dr. H. H. Goddard, Superintendent of the Training School at Vineland, New Jersey, has collected 327 family histories of those who were in his institution. Out of this number 27 have been thrown out of consideration of the causes on account of insufficient data. One hundred sixty-four or 54% of the remaining 300 histories show definitely that there are hereditary traits of mental defectiveness in the family. Thirty-four cases or 11.3% have been grouped under the head of "Probably Hereditary." Thirty-seven cases or 12% have been explained by neuropathic ancestry. Fifty-seven cases, or 19% have been described as accidental cases. There are eight histories, or 2.6% of the total number, whose causes are not known.

Somewhat similar results, showing the great prevalence of hereditary factor, have been found by other investigators.

[3] Tredgold, A. F., Mental Deficiency, p. 38.

For instance, in England, Prof. Allbutt said; "I regard feeble-mindedness (if not accidental) as always hereditary, or in other words, it is a ratio of variation. I have never met with a case of manufactured feeble-mindedness apart from accidents either at birth or afterwards." Dr. Ashby, speaking of all grades of mental defect found in early life, said: "In at least 75% the children with amentia that I have examined were hereditary and primary." In America, Dr. Barr has studied 4,050 cases of imbecility and found that more than 65 per cent of them had mental defectives in the family or among the near relatives. In Germany, Koch has collected statistics of the mental defectives in Wuertemberg and concluded that heredity could account for at least 60% of the cases. In Switzerland, (Canton of Berne) the census of 1893 showed that heredity of taint was present in 55% of idiots.

3. The Origin and Transmission of Hereditary Feeble-mindedness

That most of the cases of feeble-mindedness are the result of heredity is unquestionable. That germ cells are the vehicles of heredity has also been an established biological fact. But now we may ask: What is the origin of these defective germ cells, and what are the laws of transmission of such defects from parents to offspring? These are the questions of great biological interest and importance, but also are subjects for debate. Great minds have been engaged in the last decade for solving these problems, but none has succeeded in stating a theory which is free from objection. I propose to discuss in this section some of the theories recently suggested in explaining such complicated phenomena.

The simplest theory concerning the origin of the germinal variations was advanced by the English Royal commission for the study of the feeble-minded—that is the spontaneous theory. After careful investigation of the mental defectives in England, the Commission declared: "Both on the ground of fact and theory there is the highest degree of probability that feeble-mindedness is usually spontaneous in origin—that is, not due to influences acting on the parents—and tends strongly to be inherited."

I must confess that I fail to see any scientific value in this theory. It does not explain anything and throws no light upon further scientific research in this field. I may quote Huxley's statement on this matter. Huxley, in his "Essay on Perpetuation of Living Beings," said: "The third cause that I have to mention is a very extensive one. It is one that, for want of better name, has been called 'spontaneous varia-

tion,' which means that when we do not know anything about the cause of a phenomenon, we call it 'spontaneous.' In the orderly chain of causes and effects in this world, there are very few things of which it can be said with truth that they are spontaneous. Certainly not in these physical matters—in these there is nothing of the kind; everything depends on previous conditions. But when we can not trace the cause of phenomena, we call them spontaneous." In other words, "spontaneous variation" is but a dignified term for ignorance.

Dr. Davenport of the Eugenics Record Office at Cold Spring Harbor, New York, has recently advanced a theory that mental defectives are a completely differentiated race characterized by the absence of a unit character which is present in the normal human being. Thus he says: "It can not be admitted that feeble-mindedness is a personal and private matter. There is reason for believing that it is one of the oldest traits of mankind—a heritage from his ape-like ancestry. The feeble-mindedness of to-day is (for the most part) the dower of a germ-plasm common to hundreds of thousands of kin living and past; and if not controlled, that germ plasm may pass into hundreds of thousands of descendants. How can the product of a germ-plasm with such a history regard his traits as purely personal and private?" In another connection he again says, "The conclusion is forced upon us that the defects of this germ-plasm have surely come all the way down from man's ape-like ancestors, through two hundred generations or more. The germ-plasm that we are tracing remains relatively simple; it has never gained, or only temporarily, at most, the one or the many characteristics whose absence we call (quite inadequately) defects. Feeble-mindedness is thus an uninterrupted transmission from our animal ancestry. It is not reversion; it is direct inheritance."

Interesting is this theory, but we must accept it with a grain of salt. As we have seen before, that the chief characteristic of the mentally defective is their incapability of "competing on equal terms with their normal fellows or managing themselves or their affairs with ordinary prudence." Their lack of intelligence and will power and their inability to distinguish between right and wrong have made them incapable of adapting themselves to the environment in which they have to persist. They are unfit for survival, if we let them struggle for their own existence. The force of natural selection in human society has been made ineffective by our civilization. The feeble-minded exist to-day, because our humanitarian principles have dictated to us to keep them with great care. Our charitable institutions, state hospitals, state homes,

asylums, and the like are all intended to help the unfit survive. They would perish, if we leave them alone. I can not conceive how the ape-like ancestors of men could have survived under the most ruthless conditions of natural selection in the dawn of human existence, had they been feeble-minded in the modern sense. Unless Dr. Davenport can enlighten us on the question just raised, his theory is certainly not in harmony with one of the biological principles—natural selection—which has been proved to be of universal validity at the present stage of our scientific knowledge.

The theory to which Dr. Davenport does not subscribe is that feeble-mindedness is a phenomenon of atavism or reversion. Based on the resemblance of the intellectual and social traits of the feeble-minded with those of our ape-like ancestors, some investigators in this field have concluded that feeble-mindedness is merely an example of reversion or back-sliding to the lower part of the phyletic scale of human development. Ingenious this theory is, but it presumes that in the phylogeny of civilized man there is a phase of evolution comparable with that of the feeble-minded. Whether this presumption is correct or not is still a question for further research.

Dr. Tredgold thinks that the origin of the germinal variation of mental deficiency is a pathological one. It is not spontaneous, nor a direct inheritance from man's ape-like ancestry, nor a phenomenon of atavism, but a result of diminution of spontaneity, or decrease of the intrinsic potentiality for normal development. This nature of vitiation does not manifest itself in the manner of mutation, but is brought about gradually by the adverse conditions of the environment. Thus he says: "The conclusion to which I have come is that amentia must be regarded, not as due to the absence or suppression of some specific germ determinant, but as resulting from a diminished germinal vitality, in consequence of which development tends to be incomplete. This lessened potentiality is especially marked in that constituent which determines the development of the central nervous system—the neuronic determinant—but it is often more widespread, and then affects other tissues of the body also. In other words, the inheritance takes the form of a neuropathic diathesis, or an innate predisposition to neuronic imperfection; the actual manifestation of this innate weakness, however,—that is, the form it assumes, being often dependent upon the nature of the environment." [4]

In elaborating his theory, Tredgold further postulates that progessive degrees of feeble-mindedness are due to the progressive impairment of the germ cells through the influence of

[4] Tredgold, A. F., Mental Deficiency, p. 25.

environment. The first manifestation of neuropathic diathesis is found in the milder forms of neurosis or psychosis. Should this neurotic person marry another person similarly tainted, such germinal impairment would be further intensified and their offspring would be more neurotic than they are. Should such undesirable marriages continue in the later generations, feeble-minded offspring would make their appearance. Profound idiocy would be the final manifestation of this progressive neuropathic diathesis. The three degrees of feeble-mindedness may not happen in three successive generations. In most cases they do not. By careful selection at marriage such disastrous consequence may be avoided, or at least, delayed. But on the other hand, gross idiocy may appear in the very early generation in case the result of undesirable marriage is accentuated by some external factors.

Based on the investigations of himself and others, Tredgold said; "Thus, in persons suffering from migraine, neurasthenia, and hysteria, it is uncommon to find marked ancestral nervous or psychic disorder; whilst a history of the parents suffering from alcoholism, phthisis, and modes of life attended by severe stress and strain is frequent. In the next grade—the milder form of epilepsy—neuropathic inheritance becomes more marked, and in the severe forms of this affection it is present, according to Sir William Gowers, is about 35 per cent of cases. In the next grade—insanity—Sir Thomas Clouston and Dr. J. S. Bolton have found neuropathic inheritance in from 50 to 60 per cent of cases, whilst in amentia, as I shall presently show, it occurs in 80 per cent of cases." [5]

Tredgold's theory gives explanation both to the origin of germinal variation which lies at the root of mental deficiency and the mode of its transmission. It has been objected to by biologists on the ground that it is in direct contradiction to Weismann's theory of inheritance. Since the germ cell, as shown by Weismann, is immutable and can not be affected by the conditions of environment, somatic changes can have no influence upon the germ cell. Should Tredgold's theory be true,—that is, feeble-mindedness is the result of germinal impairment, and germinal impairment is brought about by adverse environment—then Weismann's theory of the non-transmissibility of acquired characters must be discarded. This objection is a formidable one. However, the last word of biological science has not been said. There are still pros and cons concerning Weismann's theory in the field of biology. Quite a few investigations recently made upon the lower animals tend to show that there is at least a possibility of

[5] Tredgold, A. F., Mental Deficiency, p. 34.

modifying the germ cells by environmental influences. Tredgold's theory may serve as a stimulation for further research.

The next and the most common method in explaining the laws of transmission of hereditary feeble-mindedness is the Mendelian theory. At some time between 1855 and 1865 Gregor Mendel, an Austrian monk in the small village of Brünn, carried out a series of experiments on plant hybridization. He planted two kinds of peas in the gardens of his cloister, one of which was tall and the other dwarf. He was surprised by the fact that no matter how he cut out stamens and transferred the pollen from one variety to the pistils of the other, the result of this crossing in the first generation was that all of these plants were tall; none of them was dwarf. When he allowed these to grow by themselves and be fertilized naturally, raising the fruit and planting it again in the second year, he found that throughout his whole garden there were three tall ones to one dwarf. First generation, all tall; second generation, tall and dwarf in the ratio of three to one. Beside the tall and dwarf peas he crossed many other kinds of peas of pair characters; the result always remained the same.

Furthermore, he found that if he planted the peas from his dwarf plants he got all dwarfs. No matter how many times this process was repeated, the plants were always dwarf, never tall. This was not true with tall peas. They looked just alike, but when they were planted, one third of them always produced tall peas, no matter how many years they were replanted. But the other two-thirds always yielded tall and dwarf in the ratio of three to one.

With this remarkable fact on hand, Mendel began to formulate laws of inheritance. He called tallness, dwarfness, or other characteristics as the case may be, the "unit characters." The character which appeared in the first generation after cross-fertilization he called "dominant," while the one which did not appear until the second generation, "recessive." The recessive character was there in the first generation, but did not appear. In the second generation, the unit characters segregate again and the recessive ones reappear.

The most important points of the Mendelian theory are the purity of germ cells which are carriers of various determiners and the segregation of the unit characters in the second generation. Now we may ask, Does Mendelism apply to human traits as well?

To this question Drs. Davenport, Goodard, Rosanoff, Orr, and others, have declared that heredity of feeble-mindedness is in accord with the Mendelian principle in every particular. They have assumed that feeble-mindedness is a recessive char-

acter and stated that the actual findings of their investigation correspond very closely to the theoretical expectations according to the Mendelian formula. The laws of feeble-mindedness may be briefly stated as follows.

1. Both parents being normal and of pure ancestry, all children will be pure normal.

2. Both parents being feeble-minded, all children will be feeble-minded.

3. One parent being normal but carrying defective germ cells, and the other parent being feeble-minded, half of the children will be feeble-minded, and half will be normal but capable of transmitting the defect to their progeny.

4. One parent being normal and of pure normal ancestry and the other parent being feeble-minded, all children will be normal but capable of transmitting the defect to their progeny.

5. Both parents being normal but carrying the defective germ cells, one-fourth of the children will be pure normal, one-half will be apparently normal with the capability of transmitting the defect to their progeny, and the remaining one-fourth will be defective.

6. Both parents being normal, one of pure ancestry and the other with the defective germ cells, all children will be normal, but half of them will be capable and half incapable of transmitting the defect to their progeny.

To illustrate these laws numerous investigations have been made concerning the family pedigrees of the feeble-minded. It may not be out of place to quote a few unique studies made in recent years here.

The Kallikak Family[6]—Martin Kallikak was a youth of good family. "Just before attaining his majority, the young man joined one of the numerous military companies that were formed to protect the country at the beginning of the revolution. At one of the taverns frequented by the militia he met a feeble-minded girl by whom he became the father of a feeble-minded son. This child was given, by its mother, the name of the father in full, and thus has been handed down to posterity the father's name and the mother's mental capacity. This illegitimate boy was Martin Kallikak, Jr., . . . and from him have come four hundred and eighty descendants. One hundred and forty-three of these, we have conclusive proof, were or are feeble-minded, while only forty-six have been found normal. The rest are unknown or doubtful.

"Among these four hundred and eighty descendants, thirty-six have been illegitimate.

"There have been thirty-three sexually immoral persons, mostly prostitutes.

[6] Goddard, H. H.—The Kallikak Family.

"There have been twenty-four confirmed alcoholics.
"There have been three epileptics.
"Eighty-two died in infancy.
"Three were criminal.
"Eight kept houses of ill fame.

"Martin Kallikak, Sr., on leaving the Revolutionary army, straightened up and married a respectable girl of good family, and through that union has come another line of descendants of radically different character. These now number four hundred and ninety-six in direct descent. All of them are normal people. Three men only have been found among them who were somewhat degenerate, but they were not defective . . . . Indeed, in this family and its collateral branches, we find nothing but good representative citizenship. There are doctors, lawyers, judges, educators, traders, landholders, in short, respectable citizens, men and women prominent in every phase of social life."

The Hill Fork—This is a study of two family trees in a small Massachusetts town. Out of these families 737 persons were traced. It was known that 18 of these were illegitimate. Of the 82 married women known to the investigators, 14 had bastard children before marriage and 6 have had bastard children after marriage, or 24% of the married families. Criminal tendencies are clearly shown in 24 persons, and 16 have been convicted of crime. It has also been definitely proved that 136 persons were feeble-minded, and about 10% of the total number were epileptics. It was estimated that the Hill Fork families have in the last 60 years cost the state of Massachusetts, in charitable relief, care of feeble-minded, epileptic and insane, conviction and punishment for crime, at least one-half million dollars.

The Nam Family—This is a study of a family pedigree in the mountains of western Massachusetts. There were 784 Nams traced. Out of this number 187 were alcoholics, 232 women and 199 men were licentious, and 40 became prisoners. Although feeble-mindedness was not fully investigated in these families, the evidence is strong that it was a leading trait. It was estimated that the Nams have already cost the state nearly one and one-half million dollars.

In the above studies the authors have tried to show that feeble-mindedness is a recessive character and its transmission is in accordance with the Mendelian laws of inheritance. In some cases where the actual findings were at variance with the theoretical expectations, the authors attributed them to the incompleteness of their data rather than to the limitations of

applying Mendelism to the heredity of mental traits. Should all the claims made by the Mendelism school be true, it would certainly not be extravagant to hope that feeble-mindedness could be entirely wiped out from the surface of the earth by a few generations of selective breeding. I am afraid that the transmission of human intellectual and moral characters might not be so simple as that of the tallness and shortness of peas. Now let us see what are the objections and difficulties which Mendelian school has to face with regard both to its method and theory.

In the first place, the data collected by the investigators of Mendelian school can not be accepted without reserve. The usual method employed in gathering data is to send out trained field workers to investigate the family trees of the institutional cases. The work has been very laborious and painstaking. One complete family pedigree may take weeks or months to obtain. The data obtained were usually from the testimony of the relatives and acquaintances of the person concerned. It is quite obvious that the chance for errors in using such method is very great. The reasons for this are twofold. (1) The probable error in rating a person as feeble-minded or normal, moral or immoral, is very great when the rating is made indirectly from the testimony of relatives or acquaintances, and still greater when the rating made in the same manner is concerning a person who has long been dead. (2) The potent suggestion of the influence of heredity upon feeble-mindedness may lead the field workers to be unconsciously unscientific in collecting the data. To substantiate my contention I may quote the following description of the method used by the Eugenics Record Office. "For example, by hypothesis, feeble-mindedness is for the most part a recessive trait, and the hypothesis must be tested as follows: the field worker finds a person suffering from feeble-mindedness,—a descendant of two normal parents—by hypothesis both of these parents are simplex; the field worker must understand that each parent will probably have somewhere in his or her ancestry a feeble-minded person, and it is the business of the field worker to make a special search for such person or persons in the pedigree."[7] It is hardly conceivable that the field worker should fail to be prejudiced in his method of investigation, when he is told to search for such and such person in order to prove the Mendelian theory.

In the second place, the small number of human offspring in a family makes the study of Mendelian heredity of human traits exceedingly difficult, if not impossible. Mendelian

[7] Eugenics Record Office—Bulletin No. 2.

principles follow the law of probability. Only by a large number of offspring can the theoretical expectations of different matings have a chance to appear. When Mendel experimented with peas in his garden, he could have as many peas as he wanted. Indeed, he experimented with over ten thousand peas before he discovered his formula. This can not be done in a human family. When a normal person with defective germ cells marries a person similarly tainted, according to Mendelian expectation one-fourth of their children will be feeble-minded, one-fourth will be pure normal, and one-half will be apparently normal with the capacity of transmitting the defect to their progeny. Now suppose they only have one child; we know that this child has only one chance out of four to be a pure normal. But what he shall be, we have no way to tell. Even if they have four children, these four may all be mental defective, or all normal, or of any other possible combinations. In dealing with human heredity, we can not say that such and such law will manifest itself in any particular mating.

In the third place, whether general intelligence is a unit character or not is still a question for debate. In all probability it is not. By pyschological tests it has been definitely established that individual difference with regard to mental traits is continuous. Men do not separate themselves into different types, as far as their mental traits are concerned. There is a continuous gradation of intelligence, from the most gifted genius to the most profound idiocy, each varying slightly from the next. When we use words like idiots, imbeciles, morons, dull-normal, normal, genius, and what not, we do not imply that there are some sharp lines of demarcation between them. At least we have no conclusive evidence to show that multiple-type individuals do actually exist. If intelligence is a unit character and feeble-mindedness is due to the absence of certain determiners which are present in the normal individuals, then we must have two definite groups of individuals, the normal group with the presence of determiners, and the feeble-minded group with the absence of them; each of them forms a perfectly homogeneous type. But such division is impossible; it is contrary to facts. Unless the advocates of Mendelian theory with regard to mental traits can definitely prove that general intelligence is a unit character, all arguments in defence of the theory seem to me to be pointless.

The fourth problem which Mendelian school has to face is, How the different degrees of feeble-mindedness are inherited. If feeble-mindedness is a recessive unit character, can we safely assume that low-grade feeble-mindedness is recessive to the high grade in the same manner as feeble-mindedness is to nor-

mality? For instance, if a man of moron grade marry an imbecile woman, can we say with certain degree of certainty that other things being equal their children will be morons, because moronity is a dominant character in this case? As far as my knowledge goes, we have no data to throw any light on this point. Should Mendelian laws prove to be the true phenomena of the inheritance of human traits, I think the future line of research should be directed toward the solution of the problem just raised.

In the above paragraphs, I have tried to point out some of the difficulties in the application of Mendelian theory to the heredity of moral and intellectual traits. As biological science is still in its infancy, we shall have a long way to travel before we reach a point where we can speak with considerable certainty about the laws of the transmission of mental defect. However, the re-discovery of Mendelian principles has proved to be a greater advance in the biological science toward a rational explanation of inheritance than ever before. I dare to believe that the close cooperation between the biologists and psychologists will be able to discover the secret of nature in this field, although the task is a very difficult one.

4. Feeble-mindedness and Eugenics

So far I have confined my discussion to the characteristics, the classification, the causes, and the laws of transmission of feeble-mindedness. Now we may come to the practical problem of improving the human stock.

Scientific studies have shown that feeble-mindedness is the root of all social problems. To improve our society we must first try to improve the human race, and to improve the human race we must have selective breeding as we have done with the other animals. The best and the quickest way of eliminating feeble-mindedness from our society is to prevent the feeble-minded from reproducing their kind. But the problem of Eugenics is by no means a simple one. I shall try to point out some of the fundamental problems in this field.

First of all, let us ask, Should the feeble-minded person be allowed to marry? To this question Dr. Davenport has given a definite answer. Thus he says: "While the union of a normal man and a feeble-minded woman usually does not take the form of marriage, yet the case may arise in the future, as it has arisen in the past, where a mentally vigorous man wishes to marry a socially attractive and beautiful, though defective, woman. Such a marriage may be from the standpoint of Eugenics, as from any social view-point, quite per-

missible." [8] In another connection he again says: "Weakness in any trait should marry strength in that trait . . . Let abnormals marry normals without trace of the defect, and let their normal offspring marry in turn into strong strains; thus the defect may never appear again." [9]

On this Eugenic rule many investigators in this field have not agreed. The chief basis for such a Eugenic rule is the assumption that when a normal individual marries a feeble-minded person, all their children will be normal. But this assumption is by no means always correct. In the Kallikak family referred above, we know definitely that Kallikak, Jr. was the son of a normal father and a feeble-minded mother. According to Mendelian theory he should be a hybrid normal. But he was feeble-minded and transmitted his defect to hundreds of his direct descendants. Cases like this are of quite common occurrence in all the investigations, such as the Hill Fork, the Nam family, and other family pedigrees so far investigated. Dr. Davenport may defend his theory by saying that the normal persons in these cases are not pure normal; they are simplex; they carry in their germ cells defectiveness which lies latent and reappears whenever there is a chance. Granting that this is true, nevertheless since defectiveness in the germ cells may be latent for many generations, I see no reason why normal individuals should take the chance of marrying members of tainted stock.

In general we may say that the application of Dr. Davenport's theory will result, at best, in extending the range of latency of feeble-mindedness in future generations, and in hiding defectiveness behind the apparent normality of the offspring. The recrudescence of the pathological condition may take place at any time whenever the apparently normal person with defective germ cells should unfortunately marry a person of his own kind.

The next and the most difficult question we should like to ask is: Should the simplex individual be allowed to marry? Theoretically we can say 'no,' but practically this can not be done at the present stage of our social consciousness and biological knowledge.

There are two great difficulties in our way in denying marriage to the simplex individual. The first difficulty we have to meet is public opposition. The science of Eugenics is only a few decades old. Eugenical knowledge has not been widely spread. Eugenical conscience of the general public has not been completely aroused. We may segregate, asexualize, or

[8] Eugenics Record Office—Bulletin No. 9, p. 12.
[9] Castle and others.—Heredity and Eugenics, p. 286.

make any other provisions to prevent feeble-minded persons from becoming parents during their procreative age. In doing this we have public opinion with us, because the general intelligence of the public is ready to accept the principle that the union of the two feeble-minded persons will result in feeble-minded children, and thus increase the burden of society for their support. But, on the other hand, the opposition of the public would be overwhelmingly great, if any legislature should try to rule against the marriage of individuals who possess normal mentality and good physical constitution, on the ground of their innate capacity of transmitting feeble-mindedness to offspring. The eugenists have to educate the public on this vital problem, before any measure of this kind can ever be attempted.

The second difficulty in preventing such marriage lies in the recognition of the simplex cases. Our present knowledge of eugenical principles offers us no help in this respect. We may take one of the cases in the Mendelian theory for illustration. When a simplex individual marries another person of normal ancestry, according to Mendelian theory, all their offspring will be normal. But these normal children are not all alike in the nature of the germ cells they carry; two of them are pure normal, but the other two are simplex again. Which two of them are pure normal is beyond our knowledge to tell. There is absolutely no earmark for such differentiation. The same is true when the children of the two simplex individuals are considered. Unless we can find some way to distinguish the pure normal from the simplex, any legislative measure in denying marriage to the latter will lead to gross injustice in its application.

The third practical problem of Eugenics is, What grade of feeble-mindedness should not be allowed to marry? As I have mentioned above, there is no hard and fast line of distinction between feeble-mindedness and normality. There are all grades of intelligence from practically none up to that of a genius. Where should the line be drawn for discrimination when we try to put a eugenical program into practice? The idiots and imbeciles do not constitute our eugenical problem, because they can easily be recognized and brought into public institutions. But how about the high-grade morons and the borderline cases? Should they be allowed to marry and to reproduce their kind? Certainly not, should our eugenical rule be strictly scientific. But how are they to be recognized? To this question the Binet psychologists have given a definitie answer. But the reliability of the Intelligence tests is by no means absolute. Many great masters of psychology have ques-

tioned the value of Intelligence Tests as a means of mental diagnosis. To be sure, they are one of the best means of approach in identifying and grading feeble-mindedness at our disposal. Far be it from me to minimize their usefulness in the field of education and psychology, but their degree of reliability does not warrant our unqualified reliance.

Furthermore, the terms used in describing high-grade feeble-mindedness are often devoid of exact meaning. In recent literature about mental deficiency the following terms, such as impracticalness, inadventurousness, disheartedness, incorrigibleness, quarrelsomeness, criminal propensities, sexual perversities, and the like, are often used. What do they really mean in their last analysis? Are they the special characteristics of the weak-minded and absent in the normal individuals? It seems to me that these terms are very misleading and represent a confession of ignorance. Unless we have more exact knowledge concerning high-grade feeble-mindedness, all our efforts in denying the privilege of marriage or parenthood to those who are backward in intellectual faculties would be unjust and impracticable.

From this general discussion of the fundamental problems of Eugenics it is quite clear that the effort of the eugenists should be directed along the following three lines. First, to secure legislation against marriage of those persons whose offspring will surely be defective. This task is comparatively easy to accomplish, because the public of any civilized community has generally recognized the significance of this measure. Secondly, to search for more exact knowledge than what we have at present about the nature, the origin, and the modes of transmission of feeble-mindedness. This point can never be over-emphasized. Every eugenical measure is dependent upon the success of this kind of research. Thirdly, to appeal to intelligent young men and young women not to marry into families where there is a defective hereditary trait. We can not prevent simplex individuals or high-grade mental defectives from marriage through legal means, but we can at least warn normal individuals to be careful in their selection of mates and to fall in love intelligently. Slowly but surely this educational propaganda concerning this vital but perplexed problem will bring good results.

In conclusion, I may quote the statements of Mr. Arthur Holmes which seem to me to be an excellent advice for the young people on the question of marriage. Holmes,[10] in his lecture on "The First Law of Character-making" says: "Falling in love is at least as serious a step as crossing a

[10] Eugenics: Twelve University Lectures, p. 199.

railroad track. There you are bidden to 'Stop, look, and listen.' That you should do here. Then if you must fall in love, but for heaven's sake, see more in the young lady than a retroussé nose and a lisp, or in the young man, than a cow-lick and a smooth knobbed cane. You may think you can marry the nose and the lisp, or the cow-lick and the cane alone, but unfortunately you can not. The woman or the man is thrown in with the bargain, you have to live with one or the other.

"That, however, is not the whole calamity. You can't marry a retroussé nose without marrying the girl and her father and mother, and grandfathers and grandmothers and all her uncles and her cousins and her aunts in the jail, the poor house, the asylum, and the graveyard. . . . .

"Marriage possesses so few possibilities for the universally expected foolish happiness, so many possibilities of untold woe, and so many potentialities for the largest, strongest, tenderest life two people can live on earth, that it deserves the sincerest consideration possible to be given it."

Bibliography

Bateson, W. Mendel's Principles of Heredity. Cambridge University Press, London, 1909, p. 384.

Bentley, Madison. Mental Inheritance. *Pop. Sci. Mo.* Vol. 75, pp. 458-468.

Davenport, C. B. Heredity in Relation to Eugenics. Henry Holt and Co., New York, 1911, p. 298.

—— ——. Control of Mental Defectiveness. *Pop. Sci. Mo.*, Jan., 1912.

——, Castle, and Others. Heredity and Eugenics. Univ. of Chicago Press, Chicago, Ill., 1912, p. 310.

—— and Danielson. The Hill Fork. Eugenics Record Office, Memoir No. 1., 1912, p. 56.

—— and Estabrook. The Nam Family. Eugenics Record Office, Memoir No. 2, 1912, p. 85.

Drapers' Co. Memoirs V.

—— ——. Questions of the Day and the Fray.—II, VII, VIII, IX.

Dugdale, R. L. The Jukes, 1910. G. P. Putnam's Sons, New York, p. 120.

Eugenics Record Office. Bulletins I, III, IV, VIII, XI.

——, Twelve University Lectures. Dodd, Mead and Co., New York, 1914, p. 342.

Galton's Eugenics Lab. Memoirs I. II, VIII.

Galton, Francis. Hereditary Genius. Macmillan Co., London, 1892, p. 368.

—— ——. Essays in Eugenics. The Eug. Educ. Society, London, 1909, p. 109.

—— ——. Natural Inheritance. Macmillan Co., London, 1889, p. 254.

Eugenics Laboratory Lecture Series. London. I-X inclusive.

Goddard, H. H. Feeble-mindedness. Its Causes and Consequences. Macmillan Co., New York, 1914, p. 599.

—— ——. The Kallikak Family. Macmillan Co., New York. 1912. p. 117.
—— ——. The Criminal Imbeciles. Macmillan Co., 1915, p. 154.
HERBERT, S. The First Principles of Heredity. Macmillan Co., New York.
MOTT. Heredity and Insanity. *Eugenics Review.* Vol. II, pp. 257-281.
NORSWORTHY, NAOMI. The Psychology of Mentally Deficient Children. *Archives of Psychology,* Nov., 1906.
PATTEEN, SIMON N. Heredity and Social Progress. Macmillan Co., New York, 1903, p. 214.
PUNNETT, R. C. Mendelism. Macmillan Co., New York, 1911, p. 173.
REID, G. ARCHDALL. The Laws of Heredity. Macmillan Co., New York 1910 p. 548.
RUTHERFORD W. J. A Family of Degenerates. *Mendel Jour.,* Sept. 1912.
SEGRIM, EDWARD. Idiocy: Treatment by Physiological Method. Teachers College, Columbia Univ., New York, 1907, p. 202.
SPEARMAN, C. N. The Heredity of Abilities. *Eugenics Review,* Vol. 6, pp. 219-237.
WINSHIP, A. E. Jukes-Edwards. 1900.
TREDGOLD, A. F. Mental Deficiency. Bailliere, Tindall and Cox, London. 1914.
THORNDIKE, E. L. Heredity. Correlation and Sex Difference in School Ability. Macmillan Co., 1903, p. 60.

THE CHILD AND SCHOOL ENTRANCE

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Growth is a fundamental process of life. The nature of this process in the child has long attracted the attention of students, and numerous facts regarding the shifting developmental stages have been determined. These facts, however, are more or less unrelated, and on the future investigator in this field devolves not only the task of discovering new facts to render a fuller account of the process of growth, but also, of correlating such facts with those already known, in order to cast them in true and significant relief.

Growth during pre-natal life is exceedingly rapid. In fact no period after birth can approximate this rapid growth from a single cell to 5,000,000 times its size at birth. We have come to recognize post-natal growth as consisting of alternating periods of acceleration and retardation. Minot (54) is not cognizant of such varying stages in the rate of growth in characterizing life as a process of gradual decline with age in the rate of metabolism due to the decrease of the relative amount of nucleus in relation to cytoplasm in the cells of the soma. The greatest absolute annual growth after birth takes place during the first year. Extensive investigations demonstrate that growth is very rapid during the first year or so after birth, after which there is a more or less uniform rate of growth until about 10 or 11 years in girls and 1 or 2 years subsequent in boys, when a distinct acceleration takes place. The maximum of increased growth occurs at about 12 in girls and about 2 years later in boys.

During early childhood several minor periods of acceleration are noted. Investigations before school entrance are meagre, hence only general statements are warranted. The second year of life is generally represented as less rapid and attended by somewhat less marked changes than the first. At the beginning of the third year, Christopher (22 p. 328) observed a change of the bodily proportions in a loss of rotundity and plumpness. Following this there is a period of more or less regular rate of growth until about the age of 5 or 6, when a rather distinct quickening takes place in various parts. The absolute annual height and weight values are augmented, changes in dentition are in progress, and various phenomena

of growth show alterations and irregularities in their procedure from about 5 to 7 years.

A glimpse into the investigations of such men as Crampton (25, 26, 27, 28) and Baldwin (3, 4) shows that physiological development does not proceed at a uniform rate in different individuals. Some reach accelerated periods younger than others and some pass through these periods more rapidly. They indicate, further, that the widest variation of individuals occurs at the stage of most marked acceleration—at puberty. But at the age of 6 these irregularities are quite noticeable and many inherent or environmental factors contribute to make them more significant, viz.—nationality, climate, relative social and economic status of parents, heredity, urban or rural environment, general health conditions, normal or abnormal mentally, nutrition, functioning of endocrine glands, size of families, et cetera. Variation of any of these influences may retard or accelerate physiological development. It is noteworthy, however, that in cases where some environmental factor has retarded growth, when the stage of acceleration is reached, there is an added rush as if to compensate for the time lost.

A more adequate understanding of the variable rates of growth, and an appreciation of the complexity with which growth and development take place, have antiquated the usage of chronological age as the basis of child study and a new principle has been adopted. Physiological age attempts to take account of the various factors of growth and to classify children on the basis of their physiological maturity rather than on that of years. This new standard has been demonstrated as practicable and bids fair to account well for many discrepancies to which chronological age could not be adjusted.

The changing conditions of growth at school entrance need further careful investigation before we shall gain an adequate understanding of the processes of growth at this stage and their pedagogic and hygienic imports, but it may be worth while to bring together the most significant changes, which have already been pointed out, and follow this by some deductions concerning the hygiene and pedagogy of the child at this stage of development. Our first task, then, is the enumeration of the facts of growth at this apparently accelerated period.

I. Physiological Development

Height. According to Burk (16 p. 256) the average height of the child at 6 years is 44 or 45 inches. In Hamburg, Steinhaus (66 p. 20ff) found the average height of boys at school entrance from 114 to 117 centimeters and from 115 to 116 centimeters in girls. In Breslau these averages were

reduced several centimeters. Englesperger and Ziegler (36 p. 184) give the averages of boys as 111.05, of girls as 110.03 centimeters.

The tables of Bowditch (11, 12) and Porter (56) show acceleration in height at 6 or 7 years. Boas (9 p. 188) found the annual increase in stature at 6 years greater than at later yearly periods before puberty. The increment in girls was slightly greater than in boys. Similarly, Schmid-Monard (63 p. 362) found increase in the annual growth in stature at about 6; and the acceleration occurs in girls slightly earlier than in boys.

The significant thing in any period of irregular or accelerated growth is the wide variation from the norm, that some attain the stage at an earlier age than others. Morever, some pass the stage more rapidly than others, and the rates of increment in individuals show no regularity. Let us note what facts we have as to these irregularities here. Most of the early workers made general averages, and these are of no value in such a study. In recent years a few studies show the individual variations very significantly.

Steinhaus (66 p. 20ff) measured 5914 children at school entrance and found the width of variation from 90 to 130 centimeters. 110 centimeters is sometimes given as the average height at 6 years, and from his figures 41.64 per cent are above and 58.36 below this average. The majority of the children fell within the limits 100 to 120 centimeters, but the width of variation at this early age is very significant.

Quirsfeld (66 p. 22) found the variation here from 98 to 127 centimeters, and the figures of Stephanis show boys varying from 101.7 to 124.5 centimeters, and girls from 99.5 to 123.9 centimeters. According to Englesperger and Ziegler (36 p. 183) the minimal height measurement of boys at school entrance was 96 and of girls 98 centimeters. The maximal height measurement of boys was 125 and of girls 126 centimeters. The majority of the boys were grouped within the height measurements of 107 to 118 centimeters, and most of the girls varied within the limits of 105 to 117 centimeters. They found growth at this period very irregular and individual differences more marked.

The statement of Baldwin in his recent extensive investigation is highly suggestive and corroborative of the inferences of earlier workers in this field. "From the years 6 to 13.5 the yearly increment in height varies from 1 to 8 or 9.5 centimeters. The increase from 6 to 7.5 years has no uniformity, and seems to depend on the individual. From the years 8 to 12 the usual increase is from 7 to 9 centimeters. Here too is the

greatest uniformity of increase, that is, more boys increase the same number of centimeters than at any other time." (4 p. 23)

Weight.—Weight in itself is not accepted as a very reliable index of growth. Unlike height, weight may continue to accrue up to old age, and also, once gained, it may be lost. But, taken with height, vital capacity, and other measurements, it becomes an important factor of growth, and indicates strength and state of health in a very obvious way.

The tables of Bowditch (11,12) show an average weight of 20 kilograms or about 45 pounds for boys at 6 years. Stratz gives averages of 19 kilograms for boys, and one kilogram less for girls. Steinhaus (66 p. 27) says the average at this age falls between 18 and 20 kilograms. Burk (16 p. 260) says boys are slightly heavier than girls at this age. Englesperger and Ziegler (36 p. 194) found the following facts as to weight at school entrance.

	Boys	Girls
Mean weight	18.39 kg.	18.22 kg.
Minimum weight	13.51 "	13.01 "
Maximum weight	24.00 "	24.00 "
Variation	10.49 "	10.99 "

According to Quirsfeld (66 p. 24) the variation in individuals extends from 12 to 27 kilograms. 75.4 per cent of the children measured by him had an average weight of 19.5 kilograms. Schmid-Monard (63 p. 362) found that boys gain 1.7 kilograms between 4 and 5 years, 1.9 kilograms between 5 and 6 years, and 2.2 kilograms between 6 and 7 years. The girls gain 1.4 kilograms between 4 and 5 years, 1.9 kilograms between 5 and 6 years, and 1.9 kilograms again between 6 and 7 years. Baldwin (4 p. 24) characterises growth in weight at this period in this manner: "From the years 6 to 7.5 there is little uniformity in weight increment, for it varies all the way from 2 to 15 kilograms. At 7.5 years the increase begins to be a little more uniform, and a rough average can be taken. This is about 4 kilograms."

These facts indicate that the rate of increase of some children is much more rapid than others, some gaining only 2 kilograms while others increase as much as 15. This appears indicative of an accelerated stage of development to which some attain prior to others. But in the weight factor we must not overlook the gross individual differences which may occur, when we consider its value as an index of growth.

Many of the early writers pointed out the possibility of a node at about 6 or 7 or even 8 years, and some used this as a distinct dividing line in growth and development. But only

recently have many determinative data been obtained, and much more work will be necessary, particularly in the period prior to school entrance, before very definite statements can be made. But it seems obvious that there is a rather marked period of acceleration at this time, and the lack of uniformity of increments in height and weight bears evidence that the growth and development of the individual assumes new aspects now, and that various individuals attain this stage at different ages, and these facts render chronological age impracticable for our classification of children in such a node of variability.

As previously indicated, the width of variation and the individual differences in the rate of growth are points of special significance. Bowditch states that the large children show accelerated development at the nodes earlier than the smaller ones. (4 p. 36ff). Boas, however, does not find such an inference warranted. Porter (56) has maintained that children who pass the nodes earlier in physiological development are also more advanced mentally. He found that the larger children at a given age, not only grow faster at the nodes, which they reach earlier, but they also make higher marks in their school work and pass their grades younger. Schmidt (63 p. 379), in an investigation of 2118 boys and 2142 girls, discovered that the farther children are developed physiologically the better they stand in their classes. Baldwin also found the taller, heavier and stronger children at any period better developed physiologically, and they show increment in growth at the nodes of 6 and at puberty prior to the smaller and shorter ones. He states that children who have school medical inspection, and properly directed play and physical training reach these stages earlier. He found that the groups he studied surpassed the old averages and he attributes it to these factors. He is inclined to agree with Porter and Schmidt that the mental and physiological ages run parallel in their development. At least, there seems to be a positive correlation of physiological development and school progress.

Dentition—We find a most decided state of transition regarding dentition at about the age of 6. Most observers attest that the temporary teeth continue their calcination until about the age of 5, when rapid processes of resorption set in. At about 6 the first of the permanent teeth,—the first molar,—appears. Shortly thereafter and in close intervals the median and lateral incisors erupt. It is patent, then, that we have here a diverse state regarding dentition. Some teeth are undergoing resorption and some are no more than mere shells, while new teeth appear in place of some of the old ones; and, most

significant of all, is the appearance of a new type of tooth, which assumes a position farther back in the jaw than any of the preceding deciduous teeth. All investigators seem to confirm the law that the first permanent molar marks the transition from the deciduous to the permanent teeth, excepting three cases in a German study by Berten reported by Beik (7 p. 293). It is also generally accepted that girls erupt their first permanent teeth slightly earlier than boys.

The sixth year molar whose eruption marks this transition, is unique, first, in that it is the first of the permanent teeth to appear; second, in that it is the first tooth to appear in the jaw, which has had no predecessor in position in the temporary set; and third, in that it is a distinctly new type of tooth. Moreover, it comes into function when all the deciduous teeth have passed their climactic stage and are declining, some being no more than mere shells; consequently, the functioning of this tooth has now an important rôle. It is larger and broader tooth, and is quite different from any of the deciduous teeth. Hence, its form, position, and the need of its function, now, when the temporary teeth are in resorption stages, means a new procedure in chewing, and likely a changed condition of food transterred to the stomach. Furthermore, the development of the jaw subsequent to this alteration must assume a new situation. Dr. Hall (41 p. 77) says: "The deciduous teeth are more primitive in type, and the molars are less useful in warfare, but suggest a change in food habits, and involve greater length of jaw to make room for them and greater strength of muscle."

Bean (6) made a study pertaining to the time of eruption of the teeth in Filipino, German and American children. In American Boys the variation in eruption of the first molar in the upper jaw was from 6 to 9 and in the lower jaw from 6 to 8 years; in girls the variation in the upper jaw from 6 to 8, and from 5 to 8 years in the lower. He found girls more precocious than boys in the eruption of the permanent teeth. The Filipino children were more precocious than either of the other nationalities, and the American children, in general, were slightly earlier in eruption than the Germans. The work of Welcker (75) also shows the Germans a little less precocious than Americans. American children show the greatest variability between the eruption in boys and girls. Postponement in the appearance of the teeth may be due to factors in physical development being impeded, such as nutrition, condition of the temporary teeth, et cetera.

Some regard the new molar as the fundamental factor in the general transition here. It is obviously one of the most

significant factors appearing at this time. Bean has suggested that we classify this period as well as the period at puberty on the basis of the appearance of the first and second molars respectively. He maintains that their importance is adequate to warrant their sole usage as the standard of determining physiological age. But the facts at hand hardly justify the postulation of any single factor as a criterion sufficient to determine the stage of physiological development of the entire organism. The process is apparently more complex, and the data from all the parts of the organism should be obtained and considered for a satisfactory determination.

The Jaws—The views regarding growth of the jaws at this period are not uniform in all particulars. All investigators concede that there is prolongation at this period in the posterior parts of the jaw and alveolar processes to make room for the new type tooth and the other molars appearing later in the back part of the jaw. The views seem rather conflicting, regarding growth in the anterior parts. Hunter, Fox, Humphrey and others have maintained that there is no growth in the anterior regions (80). Harris (80 p. 370) tried to ascertain whether the permanent teeth, which replace the deciduous set, occupy any additional room, and found that on the whole the permanent teeth occupy just a little more space than the corresponding deciduous teeth. Zsigmondy (80) also found a slight increase in space necessary for the permanent teeth.

Zsigmondy, Wedl, Bell and others report that there is a noticeable change in the outline of the arches of the upper jaw at second dentition. The upper jaw, which in early childhood formed a half circle, assumes a figure like the segment of an ellipse at second dentition. Less marked alterations occur in the general outline of the lower jaw.

Delabarre and Zsigmondy (80), in France and Germany respectively, observed rather significant separation of the temporary teeth, particularly in the case of incisors, coincident with the approach and progress of second dentition. The former investigator suggested that where this separation of the teeth did not take place at about 5 to 6 years, the children were threatened with iregularities and abnormalities of second dentition.

The Face—Changes in face proportions would naturally be presupposed, at the period of second denition. In measurements of children of various nationalities Röse (7 p. 299) found a lengthening of the face at a rapid rate at this time. Dr. Hall (41 p.72ff) states that beginning at 6 years new proportions of the face are assumed. In a study of children of Worcester, Mass., West (77) found three distinct periods of

growth of the face particularly characteristic of girls. The first of these ends at 7 years. He noted that the transition from one period to the other was very abrupt and attended by peculiar alterations. In general, there is a sudden disappearance of the lower widths of the face, and a reduction of the distinctly childish features. The width of the face makes a change to almost adult dimensions. Growth proceeds more rapidly and in new directions after reaching the transitional stage. The changes in facial proportions of boys follow those of girls in a general way, but the transition from one stage to another is less abrupt.

The Brain—Practically all statements regarding the growth of the brain are referred to the tables of Vierordt. Basing his conclusions upon this study, Donaldson (34 p. 104) says the encephalon practically completes its growth in weight by the age of 7. President Hall (41 p. 105) states that the brain completes its rapid growth by the age of 6 and its weight and size is almost finished then. Subsequent to this, growth is very slow. We have no indication of nodality in growth of this organ, but it is significant that the growth in weight and size is practically completed and the further development takes place in internal ramifications and connections between the various centers.

The Skull.—Some evidence of transition regarding growth of the skull is also noticed at this time. Quoting from Quain's Anatomy (15 p. 128): "The skull grows rapidly during about the first seven years of life—. By that time certain parts—including the circumference of the occipital foramen, the body of the sphenoid, the cribriform plate, and the petrous division of the temporal—have atttained their definite size. The postauricular part of the skull enlarges more than the preauricular in the early years."

Landois (53 p. 984) says the ethmoid bone fuses with the neighboring bones of the skull between 5 and 6 years. Topinard (72 p. 133) states that, "About the fifth or sixth year the suture which separates the external occipital portions of the occipital shell is closed."

The Circulatory System—Some studies show alterations in the circulatory system at about this period. Investigations have convinced Gundobin (38 p. 100) that there are three periods of "Herzdämpfung," or retardation of the heart in childhood, viz.—during the first year, from 1 to 6, and from 6 to 12 years. Beneke found a diminution of the rate of growth of the heart begining at 6 and extending to 12 years. According to Tyler (74 p. 82) the growth of the heart proceeds very rapidly the first five years of life after which the rate is diminished mark-

edly until puberty. The arteries are relatively large in childhood but grow much more slowly and thus the ratio between heart and arteries is constantly diverging.

Eminet (38 p. 121) found two periods of distinct rise in blood pressure. The rise is quite noticeable at 6, becomes much lower at 9, shows fluctuation between 11 and 12, and reaches its greatest height between 14 and 15 years. Vierordt suggested a sex difference in pulse frequency at about 6 years. Karnitzski found the specific gravity of the blood increased gradually between 6 and 8 years, and according to Leichtenstern the minimal hemoglobin quantity in the blood is at 5 years of age (38 p. 100). Perlin (55a) suggests an increase in hemoglobin quantity beginning at 6 and extending to 15 years.

It is obvious that these facts are more or less unrelated, but if corroborated and amplified by further investigations, there is significant indication of more or less general changes in the circulatory system at about the age of 6.

Gundobin (38 p. 238) concludes from investigation that the suprarenal glands show marked growth at 6 years and still greater at puberty.

Motor Control.—A few facts indicate transition in motor coordinations and neuro-muscular control. Hancock tested central steadiness from the ages of 5-7 by having the children stand with feet together and fixate a distant object. He discovered that the girls increase 32 or 33 per cent in steadiness and the boys from 15 to 16 per cent within these two years. This superiority of the girls is commensurable with our general law of disparity of growth between the sexes. Hancock also measured the quantitative unsteadiness by the tremograph and found an increase of about 50 per cent in boys and slightly less in girls. (17 p. 58). Burk concludes that girls of 6 years are more rapid in arm and hand movements due to their precocious development in general as compared with the boys. They gain a larger percentage of their total strength before 6 years than boys. Bryan (13) studied the improvement in precision of up and down writing movements in children between the ages of 6 and 16. Of the total increase in precision between these years, almost one-half was gained until the age of 8. This indicates a much more rapid motor coordinating period between 6 and 8 than in the periods of late childhood and early adolescence. A few other facts have bearing in this connection. Conradi (23) has stated that speech disorders after 6 years are to be regarded as pathological, thus intimating a stage of rather definite motor coordination some where before this time and a greater likelihood that the disorder will remain permanent hereafter. Gutzman (40 p. 51) finds a

widening of the range of the voice at 7 years and the case is more marked in girls than in boys. From these facts we infer that the motor coordinations of the speech function pass a nascent stage of development at about the age of 6.

The Larynx.—Gundobin found that the larynx grows rapidly until about the age of 5. From this time on, the most noticeable feature was that in boys it pushed forward into prominence, while in girls it became less perceptible. The first sex difference may be noticed as early as the third year but not until the age of 7 does this become very perceptible. Cunningham says that the larynx grows regularly and uniformly until 6 years, when growth ceases until puberty, where very rapid development takes place. (29 p. 972). Barth (5 p. 86) also found that growth of this organ is rapid to 6 years. Contrary to the recent discovery of Gundobin, Barth did not find sex differences noticeable, at least, until 14 years. Gutzman, as already observed, found a widening of the range of voice at about 7. The fact that growth ceases at about 5 or 6 and that the voice widens at about 6 or 7 years leads one to infer that there is a transition at this period from a predominance of structural growth to a stage of functional development of speech.

The Eyes.—We have a few facts suggestive of important changes in the development of the eye during this period. Merkel found that the horizontal breadth of the iris reaches its full size at about 6 years. (7 p. 304) Miss Sayer thinks that the ability to use binocular vision effectively and in such a way as to fuse the images of the two eyes perfectly becomes possible between 6 and 9 years. In passing through this stage of transition the child is apt to squint and he may do it to such an extent that it becomes a habit.

As many investigations have shown, the eye of the young child is hypermetropic. Woinoff (38 p. 522) has pointed out that the main difference between the child and the adult eye consists not in a change in the curvature of the eye as some have held, but in a change in the distance from the refracting medium. Adamjuk suggests that the child must be protected while changes in the visual organ are in progress. These changes cease between 8 and 12 years. Gundobin concludes that the child should not start to school until at least 7 years, or after the time when these changes are well advanced and eye strain is not apt to occur. Tyler (74 p. 142) states that the ability of accommodation and convergence of the eye to different distances is very marked at the time of school entrance. These facts lead us to believe that the eyes are undergoing rather significant and rapid changes at about the time that we ordinarily introduce the child to school instruction.

Metabolism—It is an ordinary observance that children require an additional amount of food relative to their size, particularly during periods of rapid growth. This has been erroneously interpreted by some to signify that the child grows in proportion to the amount of food consumed. Metabolism in childhood is accelerated and more heat and waste products of oxidation and catabolism are produced partly, as Camerer and Rubner hold, due to the fact that the child has a relatively greater body surface, and, partly due, as Kassowitz maintains, to the fact that the reflex arcs through which the energy is expended are shorter, and consequently, the activity greater. Tyler (74 p. 86) states that the child of 5 or 6 years produces twice as much heat per pound as the adult, and the infant produces even more. In infancy the supply of food is relatively greatest, but the smallest amount is oxidised in the muscular and nervous tissues. Emphasizing the genetic view point, he holds that the energy is appropriated to the more vital processes in the early years. Because of this genetic development, food is a paramount factor in the psychic life of the child. This concurs with the fact that the visceral organs grow relatively more rapidly in early childhood and that the higher and more voluntary functions develop later. According to Camerer (20a) there is a decided increase in the number of foods demanded at about the age of 5. Prior to this just a few foods seem to appeal to the appetite of the child, while now the varieties multiply.

Besides these facts of nutrition and their distribution to the various functions, Gundobin (38 p. 381) found a change in the constituents of the urine from 5 to 6 years. The percentage of urea per kilogram increases to 5 or 6 years and then diminishes. This age is also characterised by the smallest quantity of unoxidised assimulative matter in the urine.

Thorax.—Gundobin and Bondyreff (38: 137) have found that as a rule the thorax is circular with its widest base below up to 6 or 7 years in girls and just a little later in boys. After this time the broader base is at the upper part of the thorax. Throughout this period, and perhaps earlier, the thorax is becoming broader in proportion to the thickness through the chest.

The Roentgen Ray Method under the pioneer efforts of Dr. Rotch, (60, 61), formerly of Harvard, and Prof. Pryor, (57), of Kentucky, have portrayed some facts of the development of the epiphyses of the osseous structures at this period. Three of the small carpal bones make their appearance in the hand and wrist from about 5 to 6 years, viz., the scaphoid, trapezoid and trapezium. Besides these carpals, the

lower epiphysis of the ulna appears at 6 in girls and at 7 in boys. There is a regular order of appearance of all the carpals except the three which appear at this period. Usually not so many appear within such a short lapse of time. Hence this age is characterised by the appearance of more of the carpals, whose order is not uniform, consequently, indicating some irregularity of osseous development.

This enumeration of changes in the anatomical and physiological development at this period seem highly indicative of more or less general alterations, which further investigations will need to establish more definitely or disprove. The facts taken as a whole are representative of the general development of the organism and have suggested the probability of a condition of life when puberty may have been attained at such an early age. The conclusion of President Hall regarding this period is significant: "Indeed, there are a few faint indications set forth in the text of a yet earlier age nodality or meristic segmentation, as if amid the increased instabilities of health at the age of about 6 we could still detect the ripple-marks of an ancient public beach now lifted high above the tides of a receding shore-line as human infancy has been prolonged." (41 p. X).

II. Mental Development

In turning from the physiological to the mental characteristics of development, we find some interesting facts but no very significant and sharply delineated indications of transition. It appears that the mental development makes more steady progress throughout childhood. It is true, however, that certain psychical characteristics dominate the mental processes in certain more or less loosely defined periods, as in the case of imagination, perhaps, the most characteristic of all the mental processes from 4 to 7 years. Some investigators note the disclosure of new mental characteristics about this time, and many authors classify childhood with a dividing line at 6 or 7. There is, however, a difference in interpretation of the nascent tendencies. We shall attempt to present briefly the equipment of the child's mind at this period and indicate the mental traits, which now begin to come to the foreground and play a more or less significant rôle in his mind and life. Considerable study has been made of the mental content of children at school entrance, the first in America being carried out about 1880 by Pres. Hall (43). Englesperger and Ziegler have made very extensive investigations in Germany along the same line.

Just before this period, the chief mental interests of the

child have been sensory, and he has been developing concepts, which are often not distinguished from percepts, even at the time of his entrance into school. Imitation is exibited in no small degree in all his activities. But he is a being to himself and all his interests seem to center in himself. The independence of his interests and actions are so characteristic that Kirkpatrick (51 p. 111) has termed this the " Period of Individualization."

At about 6 years some changes in the conduct of the child are noted, the chief of which, perhaps, is an incipient tendency to recognize others in plays and exercises. The child begins to compete with other children and his interests tend to become more socialized. This social tendency becomes more and more dominant throughout this period to puberty, and is the basis of Kirkpatrick's (51 p. 169) suggesting this period as a ripe time for introducing the child to formal instruction. Dr. Tanner (67 p. 25) observes that the fibres of the brain are now developing connections between the various centers in a rapid manner, and in consequence we notice mental changes in the child. " He has more interests, he plays more kinds of games, and he has a wider range of friends than before." His activities begin to go out in more manifold directions and there is general, through rather steady, mental expansion.

Dumville (35 p. 145) does not think there is any qualitative change in mentality at this period. He notes a slight increase in the ability to concentrate the attention over longer lapses of time. Also, the range of ideas begin to widen rapidly. He notes, further, that the child begins to show social tendencies in his interests and games. But, there is no sudden change, nor is there a qualitative increase of mental processes. The change occurring consists in a gradual transformation of processes already present and a greater facility of using them. A somewhat similar view is held by Thorndike (71 p. 92). " The six year old has all the elementary feelings involved in reasoning. The change which occurs is not the appearance of these feelings but their increase in number and in definiteness and a change in their manner of use."

Meumann (52a p. 107) states that the attention of children at school entrance passes rapidly from one object to another and is very easily diverted. Sustained attention is almost impossible with most children, and if attempted, produces fatigue very rapidly. Bagley (2a p. 188) says passive attention is characteristic at this period but soon active attention begins to function also.

The interests of the child are described by Nagy (65 p. 391) as being subjective from 2 to 7 years, and from 7 to 10 they

become more objective. Meumann (52a p. 116) observes that perception at school entrance is much more subjective than in later years. This pronounced subjectivity is one of the bases of the decidedly imaginative mind of the child. The sense of judgment is undeveloped, consequently falsehoods are a natural product of the child mind. Three types of perception are characterised by Meumann. The child of 6 or 7 years has a " fantastically synthetic " perception. Analysis of an object perceived is totally lacking, but there is a peculiar focalization on some one feature of the object, which is seen as a unit and the rest of the percept is ignored. The child does not combine a number of impressions into a single picture, but attaches his attention to one phase,—hence, a house is seen as a door, or even as a keyhole, perhaps. At about 8 years the analytical type of perception dawns, where parts, relations, properties, et cetera, are observed. Later, another synthetical type appears, but characteristically different from that at about 6 years. An object is perceived, analysed into its component parts, relations of parts are judged, and all taken together are synthetised. The child at school entrance uses concrete imagery in the main, while the adult employs verbal imagery chiefly and is able to judge the relation of parts and connect all the characteristics and parts into a unified whole. Perception in the earlier stage might be termed individualistic as compared with the unified perception in the later synthetic period.

The investigation of Dr. Mateer (20a) on the establishment of conditioned reflexes in children has revealed a striking situation at about 5 years of age. In general she found the ability to establish associations increases with chronological age, but at about 5 years new potentialities open up to the child. The curve becomes less regular, and the number of trials to establish associations show much more variation. Dr. Mateer suggests that potential powers, dormant heretofore, seem to dawn now in greatly increased numbers. She has even been led to regard this as somewhat analogous to and suggestive of the differences between the pre-adolescent and the adolescent.

In her review of the study of Pohlman, Dr. Smith (65 p. 386) stated that children of 6 years frequently do not have an understanding of the words they use. Words are employed as combinations of sounds without regard for meaning and context. Dr. Tanner (67 p. 415) agrees that at 7 years, " The love of words on account of sound persists," but from this time on words gain value in meaning.

Imagination is one of the most prominent mental manifestations at this age. It is portrayed in all plays and activities.

Kirkpatrick (50 p. 155) says imagination reaches its climax in the fifth and sixth years. It is distinctly vivid but notoriously inaccurate. He believes the mental images are analysed, shifted. and recombined more readily than in the case of adults. (51 p. 189). Slaughter (64) finds that the fancies of the child go in all directions now, and perceptions are transformed into fancies and are projected. The clouds provide the best screen for this, and anything from mountains to animals may be represented. Many other objects of nature are utilized by the child for projecting his fancies. In dark and secluded places he imagines horrible things and the emotions contribute their share to the imaginal products of the mind. His imagination also carries him to the invention of secret languages. Chrisman (67 p. 415) found that these begin to be formulated as early as 5 and 6 years. Dix (33 p. 75) says children of 6 years or over are often prone to day dreaming. According to Kirkpatrick (50 p. 138) imaginary companions are frequently created as early as this period.

Imitation is manifested in most of the activities of the child. The dramatic tendency is at its height in children from 4 to 7 years. (50 p. 138). Dr. Tanner (67 p. 376) says imitation is one of the chief media of education up to the age of 7, but thereafter its importance decreases. She also states that it has been found from Stern's "Aussage Tests" that the child becomes less suggestible at a very rapid rate beginning at 7 and extending to 15 years. (67 p. 189).

Dr. Hall (42 p. 220) noted that the collecting instinct began in childhood, and continued through adolescence. In his summary of the ages at which certain articles began to be collected, it appears that many begin at about 6 years. He characterises the manifestations of this impulse before 8 years as "Crude, groping and undirected."

It is in the play of the child that we find his mental equipment in its natural order. Here imagination and imitation are exercised freely and spontaneously and we discover his natural endowment better than in any other of his activities. His waking life is not much else than play. Dr. Tanner (67 p. 498) says children under 7 years do not play games unless urged by older children or adults. Their plays up to this time are individualistic and non-competitive. After 7 such games as, "Hide and Seek," "Tag," "Prisoners Base" and "Fox and Hounds" begin to be played. In these games competition plays an increasing rôle with advancing age. Kirkpatrick also noted such a change in the plays of the child, as already indicated. In the story of the Sand Pile, Dr. Hall (42) observed that the boys did not do much organising the first summer or two, but

after they passed 7 or 8 years, they began to make permanent plans as to the arrangement and organization of the play yard. Before this the interests and activities had been without much foresight and planning and they dug and built things which were soon destroyed. After this everything was planned and executed with a view of permanency. Schmidt (62 p. 17) states that in the sixth year the child becomes more interested in running, skipping, hopping, and the more violent exercises.

According to Dr. Tanner (67 p. 267) the child accepts unquestioningly what is told him regarding religion as well as other things before the age of 7. Hereafter, questions begin to be asked concerning religious matters. Quoting Dix (33 p. 129), "Children of 6 years are well awake to the voice of conscience as the whisper of God." This can be evoked, he says, by putting a few simple questions as to God and His place in the universe.

Dr. Tanner (67 p. 317) believes fears both of things seen and heard diminish slightly at the age of 6. Also, jealousy is manifested before 6 by stamping, kicking and screaming; after this age it is more apt to appear in sulking, slandering and threatening.

Some increase in the discrimination of colors and olfactory and taste perceptions are noticed here. Decroly and Degard (30 p. 107) relate from a study that at 5 years children do not discriminate many of the fundamental colors, and at 6 or 7 years only 43 per cent knew completely the series; white, black, red, green, blue and yellow, and none knew brown, gray and purple. Tracy (73 p. 17) also finds that many children at school entrance cannot discriminate or name the elementary colors. Englesperger and Ziegler (53a p.230) investigated the discrimination of colors in children at school entrance and found that 30 per cent of the boys and 28 per cent of the girls could recognize and name the primary colors. Upon presentation, white and black were named by all the children without a single error. Meumann thinks it very significant that the child learns to associate the words white and black with their respective achromatic sensations before the names of colors become associated with their chromatic sensations. As a rule girls excel boys in knowledge of colors.

Garbini (21 p. 78) found a change in olfactory perceptions at about the age of 6. The child begins to correlate the olfactory perception and its corresponding verbal expression. Furthermore, he begins to differentiate between different intensities of the same quality of odor. With the changes in the teeth and the chewing surface, there appears another striking alteration in regard to taste. In his study of foods,

Bell (8) found that taste becomes mentalized at about 7 years, and that it has now a new and almost independent value. He states further, "The new importance of taste is shown by the universal tendency of children in this age to want to taste everything that is to be eaten or drunk, and many things that are not. They haunt the kitchen, the pantry, and the medicine cabinet. Their curiosity in the nature of different foods and the different methods of preparing them is increased to a remarkable degree, and taste becomes more than ever before a special organ of apperception." He notes also that along with this new tendency to taste things, children like to make all kinds of mixtures of foods and drinks, and also, demand a certain amount of raw food materials, that they may themselves exercise in preparing it. He states that this impulse begins at about 7 years and is dominant in both sexes.

In the revision of the Binet-Simon Tests, Terman (69:175) indicates that children at 6 years first distinguish perceptibly between right and left, and between morning and evening. Dr. Hall (43 p. 144ff) points out some interesting sex differences as to mental content at school entrance. He says, "Girls excel in fairy tales and boys in religious concepts. . . . More boys could repeat sentences said to them, or sing musical phrases sung to them, or sing a song, than girls. . . . The girls excel in knowledge of the parts of the body, home and family life, thunder, rainbows, in knowledge of the square, circle and triangle, but not in that of cube, sphere and pyramid. Their stories are more imaginative, while their knowledge of things outward and remote, their power to sing and articulate correctly from dictation, their acquaintance with numbers and animals, is distinctly less than that of boys. Boys seem more likely than girls to be ignorant of common things right about them."

These indications of sex differences were chiefly drawn from the investigations of others. Dr. Hall states that the most characteristic difference in his own study was that girls had knowledge of the parts of the body superior to that of boys.

This collection of facts concerning the mental status of the child at 6 years does not afford us much conclusive evidence as to transition. We note a more or less gradual and progressive development during this period. There seem to be new awakenings and nascency in some of the mental processes which heretofore were dormant. It appears that the environmental conditions during these early years determine largely the content of the mind. The social and economic standing of parents seem to contribute to the imitative propensity of

children as Dr. Hall has suggested. The better off the parents, the less imitative and stiller the children. The sense of right and wrong seems to be wholly dependent on the moral training and discipline imposed by parents.

From these facts we must conclude that the mental development proceeds through this period with a much more uniform rate of progress than in the case of physiological development. Imagination and imitation are at their climax, and soon recede in importance, and hereafter the subjective predominance of all the mental processes is diminished. The plays of the child seem to pass a rather marked stage here and the recognition of others grows with age in increasing importance. Games in which others compete begin to be indulged in soon after passing this period. The ability to form associations is indicated as somewhat transitional and perception makes a characteristic change at about 7 years. One writer thinks the ability to concentrate attention over longer periods shows a little progress at school entrance and another says active attention begins to function hereafter in addition to the dominant passive attention. There seem to be significant changes in the psychical states in olfactory and gustatory perceptions. The mental processes in general seem to undergo rather gradual transformations and interests widen and multiply. There is a shift and accentuation of processes which in early childhood were in the periphery of consciousness. Numerous studies have been reported on the content of mind at school entrance. It appears that a more promising point of attack would take account of the mental attitudes and the manner of procedure in accomplishing a task. The study of Meumann on the characteristics of perception in the child is in point here. Such studies seek to discover the processes rather than the products of mind, and if we shall ever apprehend the psychical development at the various stages we shall need to concern ourselves not only with the contents of mind, but also with the processes which underlie and mould them.

III. Pathology, Morbidity, and Mortality

Pathological Conditions at Six Years.—Among the most noticeable pathological conditions at this period are those affecting the speech function. Kussmaul (15 p. 240) states that stammering may be due to inborn conditions, or to acquired faults of the use of the organs of articulation and breathing; it may be a functional disorder due to incorrect instruction or wrong practice of the use of the organs of speech, or the trouble may be purely organic. It is quite possible that all these factors may be complicated or

one may occur as a single cause of incorrect vocal expression. Speech disorders are manifest throughout the period of the development of the organs involved, and the trouble is often largely due to incoordination of the motor powers essential in the speech function. Though they are prevalent at all ages in childhood, we find rather conclusive evidence that there is increase in these disturbances at the 6 year period. Many investigators seem to attribute the faults of speech to improper school conditions; at least, they are generally looked upon as a school disorder.

Clouston (44 p. 745) places stammering among the neuroses which accompany "The periods of most rapid brain growth, special sense education, and of the development of leading motor coordinations," viz. from birth to 7 years of age. Conradi (23 p. 348) states that speech disorders are regarded as normal in early childhood, but after about 6 years they are to be classed as abnormal. He gives irregularities of the teeth as a most common cause of stammering. Faulty occlusion of the jaws is also a source of difficulty. Gutzman (39 p. 275) also finds the lack or improper position of the teeth a common cause of defective articulation.

Stuttering presents still more distinct evidence of nodality at this period. Most investigators regard second dentition and puberty as periods in which children become more susceptible to stuttering. Kussmaul (52 p. 232) noticed a significant increase in the percentage of children stuttering at these periods. Baginsky (2 p. 351) designates the years from 7 to 8 and from 12 to 14 as periods in which there is temporary rise in stuttering. The statistics given by Hartwell (44 p. 746ff) also indicate a temporary rise at these periods. "The table also shows what has frequently been noted, that stuttering is most frequent at the period of second dentition, and at the onset of puberty, which are the periods when the nervous system is specially susceptible to disturbance."

Holt (46 p. 691) suggests that most people who become habitual stutterers do not begin until after 7 or 8 years. It has long been recognized that the prevalence of this trouble is much less in girls. Some hold that it is very rare that girls stutter. Perhaps the most reliable figures are reviewed by Terman (68 p. 337) in which the ratio of the predominance of this trouble in boys and girls is as 3 to 1. Most investigators would make this ratio still more discordant.

The table given by Conradi (23 p. 365) from his study of 87,440 school children corroborates the main facts already noted. His figures indicate that the tendency towards a natural cure after these periods of changing development is

stronger in the case of stammering than in stuttering. His study is conclusive that there is marked increase in these disorders at second dentition and another rise at puberty. After the pubertal age the number decreases very markedly, and in the case of stammerers is very rare after about 15.

According to Kussmaul (52 p. 259) speech and audition are intimately related in their development, particularly before 5 years. He says that the origin of the trouble in deaf mutes can usually be traced back to the first 4 years of life. Deafness occurring after the age of 5 does not affect verbal imagery, even though it may debar the speech function. Heerman (48 p. 342) concluded from his study of children that those losing their sight before 5 or 6 years did not employ visual imagery in their dreams. He also believed that those who lost audition before this age became mute as well. More recently Jastrow (48 p. 342) confirmed the view that a loss of vision before 5 or 6 years incapacitates the individual to dream in visual terms. He describes the significance of this period, as follows: "The period from the fifth to the seventh year is thus indicated as a critical one. Before this age the visual center is undergoing its elementary education; its life is closely dependent upon the constant food supply of sensations; and when these are cut off by blindness, it degenerates and decays. If blindness occurs between the fifth and seventh years, the preservation of the visualising power depends on the degree of development of the individual. If the faculty is retained it is neither stable nor pronounced."

Terman (68 p. 25) sounds a note, which is gradually increasing in strength as we gain more knowledge of the development of the child. "It is now well established that the period of about six or seven years is marked by an increased frequency of nervous and digestive disturbances."

A very frequent irregularity occurs at this node in regard to the heart. This organ is very small in childhood and the arteries relatively large, as elsewhere indicated, and the growth and increasing demands on the heart often lead to fatigue and even more disastrous consequences. Christopher (22 p. 328) presents the result of his study thus, "Not infreqently children seven or eight years of age present the anomaly of dilated heart, and quite frequently evidence of cardiac incompetence, such as shortness of breath and readiness of fatigue. . . . The child of seven fatigues less readily than the child of six years, but the child of eight fatigues more readily than the child of either six or seven."

Beik (7 p. 315) has found that abnormal conditions of the tonsils frequently occur with the appearance of the first per-

manent molars. The tonsils inflame and enlarge and lose their power of resisting infections of micro-organisms. Tyler (74 p. 142) says curvature of the spine is very apt to be started now. Some investigators note a decided tendency towards myopic vision at about this time. The eye passes a transition in development and eye strain is very apt to occur.

These facts indicate nodality here in the development of various organs and their functioning. There is general instability and lack of completed neuro-muscular development in the case of quite a few organs. After this transition injury or apathy of the same organs might lead to quite different symptoms. With the facts of muscular development mentioned above, these additional facts seem adequate to establish that the motor coordinations of the more fundamental, and perhaps of some of the accessory types, undergo significant changes within this period.

Morbidity and Mortality.—It is well recognized that in early childhood the percentages of sickness and death are very high as compared with later life. Contagious and infectious diseases are more apt to attack the organism in the very early years. More than 90 per cent of deaths from contagious diseases occur before the age of 10. In the early years the child is making rapid adjustment to his novel environmental conditions, and in the procedure of growth the equilibrium of the different processes may not be maintained; thus, the child is rendered more susceptible to morbid conditions. It is also a commonplace that in the first few years of life, the child, if attacked by contagious diseases, as measles, mumps, whooping cough, scarlet fever, diphtheria, et cetera, is much more likely to succumb. Some of these diseases, as the first three named, occurring later in childhood, seldom cause death. In early childhood these diseases attack the very processes which subserve the vitality of the organism. Abbott (1 p. 27) says in early childhood these diseases attack the lymphatic, osseous, and serous tissues, and growth is rendered impossible or at least retarded.

Statistics show that at about 5 or 6 years there is a rather marked reduction in mortality, although there may be some increase in the morbid conditions as Terman (68 p. 25) suggests. Hartwell (45) has shown that fatality of diseases is much reduced at puberty, and it has been established that the periods of accelerated growth are accompanied, on the one hand, by an increase of acute morbid conditions, and on the other, by an immunity to fatality of diseases. More diseases may attack the organism but less deaths occur. This law would not obtain during the first few years of life when the child

is making his first rapid adjustments to his novel milieu, and before some of the inner glands and tissues begin to secrete antitoxins. However, facts seem to warrant the suggestion that the physiological transition at about 6 years, the rapid growth of certain parts of the organism, and the altered function of certain organs at this time, may be found to play an important rôle in the patent diminution of mortality. Moreover, this change in development renders the organism more susceptible to disorders and morbid conditions increase.

Burgerstein (14) has made a study in several cities in Germany as to morbid conditions in childhood and finds the resistance to disease much greater after school entrance. It would appear that on entering school, where the child is subject to more contagious and infectious diseases, and often more favorable means of contracting them, the conditions would be made worse rather than ameliorated. But the resistance of the organism becomes so marked that this is more than compensated for. There seems to be a gradual increase in resistance after the first year, but the case becomes distinctly marked after about 5 or 6 years.

Rial (59) finds that the largest percentage of children succumb to measles in the second year. From 3 to 5 years there is an increase in the number of children attacked, but a much larger percentage overcome the disease. After 5 years this power of resistance becomes very marked.

Burgerstein (15 p. 258) refers to the table of Hertel on morbidity, which shows no sex difference at 6 years, but at 7 there begins a sex differentiation, particularly regarding the impoverished condition of the blood in girls. The anemic condition increases to puberty when it becomes very marked.

It is patent, then, that some changes in the organism make for better resistance of diseases at about 6 years. The morbid conditions seem to multiply, but there is a very marked decrease in deaths. This period, therefore, in a certain sense resembles that of puberty.

IV. Pedagogical and Hygienic Considerations

As far back as we have record, it seems to have been customary for school instruction to begin at the age of 5 or 6. Just why the child was taken from his home environment and placed in school at this age by the peoples of all times is not definitely known. This custom has passed down through time and has been in practice almost universally. Some radical pedagogical theorists, as Rousseau and Pestalozzi, arraigned this traditional custom and proclaimed the inappropriate environment of conventional schools for children of this age.

Their general observation of the nature of development gave them an idea of the needs and demands of the growing child, and a conviction that the conventional school environment did not satisfy them. In recent years there has been considerable discussion and some scientific investigation concerning this question. We believe the problem is now being attacked with a view to meet the needs and demands of the child, and that some insight into the requirements at the various stages of development has been gained.

Our chief concern in dealing with the growing child should be to make his growth conditions the very best possible. The principle of adapting instruction to the needs of the individual child is one of paramount importance. Let us epitomize, briefly, some of the facts already enumerated in an earlier section of this article regarding the developmental status of the child at this age. The fact of prime importance, as already indicated, is that many phases of development indicate more or less marked transitional characteristics. We found that the average boy of 6 years measures about 110 centimeters, but individual variations may range as much as 30 centimeters. Somewhat similar variation occurs as to weight. The changes in the teeth and jaws are distinctly transitional, and there is likewise wide variation; some children have not erupted all four of the first molars until after 9 years. In development of the osseous structures of the hand and wrist, we also found significant changes. Some indications of rapid development of motor coordinations are also suggested. Stuttering is common, and the development of the eyes is in a stage of adjustment. The rapid growth of the brain and the accompanying increase in size of the skull show a change in rate of growth, in which the growth both of skull and of the brain size and weight comes to an approximate standstill. A change in the range of voice is manifested, and we have differentiation of the sexes at this time in regard to several phenomena of growth for the first time.

These facts suggest a period of more or less general transition of development, wherein retardation and acceleration account for the increased width of variation. It has been shown that some children reach the stage of transition younger than others. Some children are accelerated in their development while others are retarded. Thus, a group of children of the same age may show a range of variation in development of several years. This fact makes chronological age impracticable as the basis of admitting children to school. The principle of physiological age, so strongly advocated in recent years, allows only children of a certain physiological

maturity, regardless of their age, to enter, and those of retarded development are not admitted. The school environment has been indicated as a factor in prolonged retardation. In order to meet this condition, Dr. Burnham (18, 19, 20) has long advocated a health examination at school entrance. He would urge that the parents cooperate in this examination, and thus, they may give as well as receive information concerning the child and his welfare. It appears that such a procedure would avail much good both in the schools and in the homes. Many parents, ignorant of bad influences in the environment of the child, might assist in eradicating them.

Besides the possible discovery of retardation by the examination, organs and glands which function improperly or which may be defective may be discovered and remedies applied, and the child thus avoids later impairment in development. Defects of these organs, diseases to which the child may be predisposed, his peculiar habits, and much information of the individual child become important considerations for both teacher and parent in their dealing with him.

In order to further our knowledge of the individual child, Dr. Thiele (70) has made a biological study of children in Chemnitz just before school entrance. He studied 5538 children between the ages of 6 and 7 years. The basis of his study was the returns to questionnaires sent to the parents in which he inquired; the number of parents living, number of children in the family, diseases the child had had, whether the child was born prematurely, were there any epileptic or pathological ancestors, when did the child begin walking, accidents the child had experienced, defects of sense organs or of glands, of nutritive function, et cetera. Among the interesting facts revealed in his investigation were that, where there was an only child, he had had less diseases, walked earlier, was more interested in older folk and showed precocity in general. As to diseases in families of 6 or more children, the conditions were no worse than where there were only 2 or 3 in the family. It appears that such a study of the hereditary influences in the family, as tuberculosis, epilepsy, or abnormal mentality, should furnish us a good clue in our study of conditions of development, and in our grading and attempt to provide the individual child with proper training and instruction. Retardation in development may often be traced to some hereditary factor of which the above diseases may be symptoms. Such studies are indispensable in explaining retardation and irregularities of development. Measles was the most common disease, about two-thirds having had it. His

study concerning the impoverishment of the blood would also prompt an improvement of health conditions.

Quirsfeld (19 p. 238) made a study of the effect of school influences on growth during the first year. Among 1014 children the increase in height the first year of school attendance was 2.5 centimeters. After this the annual increase was about 5 centimeters. Also weight during the first year in school was only .5 kilogram, while the next year the annual increment was between 1 and 2 kilograms. During the first year there was a decrease in weight of 15.87 per cent of the boys and 24.84 per cent of the girls, and a condition of standstill prevailed among 29.73 per cent of the boys and 44 per cent of the girls. Here, about 75 per cent of the girls and nearly 50 per cent of the boys show no increase in weight at all in the first school year. He also says that in 29.59 per cent of the boys and 49.05 per cent of the girls there is a decrease in muscular development during the first year of school attendance. It is patent from such facts that the child of retarded development should not enter school, at least, until he has reached the transitional stage of development. From the suggestion of Baldwin (4) and Porter (56) that mentality and physiological growth are correlated, to enter a child of retarded development means that he will probably be unable to keep up with his class in addition to his retardation period being prolonged. Thus, the health examination at school entrance becomes an important factor in grading.

An interesting study conducted in Munich from 1892-94 demonstrated the more appropriate use of vertical writing at school entrance. Both Berliner and Seggel agree that vertical writing gives a greater distance from the eye, thereby favoring this unstable stage of development. (66 p. 22). Slant writing has been charged with inducing asymmetrical development of the body and lateral curvature of the spine during the periods of rapid growth.

Seggel says the time of school entrance is a period when myopia is easily induced. When children below the height of 110 centimeters are allowed to enter school, special observation should be given to the distance of the work in order to avoid eye strain, or else the child should not enter school until his eyes have passed the transitional stage, and he is able to fuse the images of the two eyes properly and make skillful accommodation. The eye is of such importance that the greatest care should be exercised during this stage of rapid changes.

The statement that stuttering increases at school entrance, and its being characterised as a school disorder may only

signify in the majority of cases that the neuro-muscular co-ordinations are passing a stage of transition, and have not become definite; hence, the child should not be subjected to worse conditions until he has passed this stage.

Steinhaus (66) advocates that the mental status should show certain characteristics before the child is admitted to school. His memory ideas, and the reconstruction of them, should show clearly that they are available for use, and that he is capable of employing them effectively. By applying a test here we again improve our grading system. Dr. Burnham (19) suggests that it may be impossible for us to learn with any degree of definiteness the type of imagery a child of this age uses predominantly, but we can get at the type of his learning and his comprehension of things to be learned. The Stanford revision of the Binet-Simon Tests (69) asks the child of this age to repeat a certain number of syllables, to define certain words, which are names of ordinary objects, et cetera, and his mode of response in this procedure can well give us an idea of his type of learning. Various other tests can easily be devised for this purpose. The mode of attacking a simple task is more important than the accomplishment of the task itself so far as it pertains to eligibility for school entrance.

Dr. Burnham (19 p. 227) suggests that our examination at school entrance should consist of four main factors; 1. the physiological age, 2. the psychological age, 3. the general health condition of the child, and 4. the history of morbidity of the individual child. This plan is very comprehensive and if carefully worked out and applied should provide the necessary data for us to deal judiciously with the child. No one of these factors, however in detail it may be studied, is adequate for a safe judgment of the child's status but all should be considered in our determination of his stage of physiological and psychological development.

The datum of a health and morbid examination at school entrance is an indispensable criterion for the teacher in dealing with the child, and furthermore it gives opportunity for the remedy of troubles in the period of growth when slight matters can be most easily rectified and overcome. The conditions of the teeth, nasal and pharyngeal cavities, tonsils, and the functioning of glands should be carefully looked into, and as far as possible all the factors which control and promote growth and development should be kept in normal condition. The types of diseases which the child has had in his early years, and those which seem to have an hereditary influence in his family should be carefully noted and considered. Individual records

should be made and filed. Bad habits should also be noted and included in the record, and remedies applied to overcome them. These factors should all be considered in our determination of the child's fitness to enter school, and they should likewise be carefully considered in all our dealing with him after he enters.

Thus, it appears unwise and even dangerous to admit the child to school before this stage of transition has been reached and perhaps passed. To admit him before he reaches the transitional period portends an arrest in development; to admit him while he is in the stage of transition before permanent adjustment in various processes of development has been made may mean injury to certain developmental features due to overstrain at the nascent period. Some corrective measures in school instruction may make the change from the home to the school less harmful, but at present it appears proper not to allow the child in the school until he is well past the stage of transition. Dr. Burnham (20) suggests as a minimal requirement that he should have all four of the first molars, his height should be 115 centimeters and his weight 20 kilograms.

It has been suggested by various writers that the transfer from the carefree life in the home to the monotonous grind and state of repression demanded in our schools may have disastrous effects on the growing child. The schoolroom may be unhygienic, and the type of life exacted is frequently not adapted to the needs of the child. The study of Quirsfeld (19) referred to above indicates a retarding influence on growth incurred in the first year of school attendance. An important and primary step, then, when once we have an insight into the nature of growth and development and the type of life appropriate at the various stages, is the correction of the school instruction. The child should not be expected to sit stockstill for several hours, and after a short intermission return to a similar state of confinement in the afternoon. Intermissions should be more frequent, and the type of instruction should give ample opportunity for activity. The predominance of the work in these early years should be motor training, and such instruction as appeals directly to the senses. The very nature of the child, as we note his spontaneous activities, would teach us that he demands constant change and freedom of action. The greatest reform in our educational procedure, and one which is becoming more and more urgent, is the adaptation of the work to the needs of the individual child. A fuller adoption of such a policy in educational practice prom-

ises a significant advance and improvement both for the mental and somatic development of the child.

Conclusions and Suggestions

The data presented in this study seem adequate to warrant the assumption of a general stage of transition in development at about 6 years of age. The phases of development and other conditions of the organism which indicate such transition may be briefly summarized as follows:

1. The annual increment in height from about 5 to 7 years of age is greater than in the subsequent years before puberty. The increment in individuals varies widely, indicating that the rate of growth has no regularity during these years and that various individuals reach the period of accelerated growth at different ages.
2. In weight, great irregularity occurs in the annual increment. From 5 to 7 years of age no general average can be taken, but thereafter this is possible. The annual increment varies widely and depends on the individual.
3. Very distinct changes in dentition occur at this time. The eruption of the 6 year molar marks the transition from the deciduous to the permanent teeth. The characteristics of this new type of tooth and the changes accompanying its eruption mark this period distinctly transitional regarding dentition.
4. The jaws show significant changes of development at the time of the appearance of this new type of tooth. Slight changes may occur in the anterior parts of the jaw, but in the posterior portions the alterations are quite obvious.
5. The skull has been found to grow rapidly until the age of about 6, when the rate of growth is markedly diminished. Some portions of the skull have attained their definite size at this age.
6. The face shows characteristic changes coincident with the eruption of the 6 year molars and the altered development in the posterior portions of the jaws.
7. The brain has attained its approximate size and weight at this period. The growth of this organ is very rapid up to about 6 or 7 years, after which the rate of growth is reduced very greatly.
8. In the circulatory system, the heart grows rapidly during the first 5 or 6 years, after which the rate of growth is reduced noticeably; moreover, a rise in blood pressure occurs at the age of 6.

9. The suprarenal glands, as indicated by one investigator, grow very rapidly at the 6 year period and then diminish in rate of growth until puberty.
10. Motor control and neuro-muscular coordinations show a stage of rapid development here.
11. The larynx has been found to grow much less rapidly after this period, and the range of the voice is widened somewhat.
12. The eyes show marked development in ability of binocular function, and changes indicating more facile and adept accommodation and convergence occur.
13. The variety of foods demanded by the child widens greatly at about 5 or 6 years and taste becomes "mentalized." The waste products of metabolism show some significant changes. The smallest amount of unoxidised assimilative matter in the urine is from 5 to 6 years.
14. The thorax is circular with its widest base below up to 6 or 7 years, and thereafter the widest base is at the shoulders, and the thorax becomes less circular.
15. The development of the carpal bones of the hand and wrist exhibit rapid progress at this period. Several new carpals and the lower epiphysis of the ulna appear in the 6-7 year period.
16. Some less sudden changes in mental development have been noted. Play gradually becomes less individualistic, the range of knowledge increases, the facility of establishing associations is increased, the characteristics of perception become less subjective after about 7 or 8 years, taste and olfactory perceptions make significant changes, and other processes of the mental life show more or less gradually progressive development.
17. Stammering and stuttering show marked increase at this period.
18. Nervous and digestive disturbances are increasingly prevalent at 6 and 7 years of age.
19. Cardiac incompetence and anomalies of dilated heart are apt to occur at this period. Fatigue is a very common complaint.
20. Abnormal conditions of the tonsils occur about the time of the eruption of the first permanent molars and often lead to infections by microorganisms.
21. Morbid conditions increase at this period; but the rate of mortality is distinctly lessened, thus indicating a state of increased resistance to disease.

These various points indicating transition are representative of almost all phases of development, so that it seems safe to

conclude that the processes of development in general pass a stage of transition here, and are modified noticeably in passing this node.

Some interesting sex differences occur in development at this early period. It is well known that girls attain their completed growth about 2 years prior to boys, and in some phenomena of development differentiations begin early in life. The facts regarding height and weight at the 6 year period are not very decisive, however; the figures of Boas show the annual increment of height in girls a couple millimeters greater at this period. All studies indicate that girls are more precocious in development of dentition than boys. It is also stated that they attain full size of skull and brain earlier than boys. Vierordt found a manifestation of sex differentiation in pulse frequency at about this time. In motor control, girls have a larger percentage of their adult strength at 6 years than boys and show more rapid development of motor coordinations during this period. The studies by the Roentgen Ray Method show girls precocious in osseous development in general. Likewise, some sex differences were noted in mental development. Also, girls are found to be less susceptible to stuttering, the boys prevailing in a ratio of 3 to 1. A sex difference appears in the impoverishment of the blood beginning at about 7 years. In brief, these sex distinctions are points well worth noting. Just what pedagogical import such facts may have remains to be determined.

A matter of chief concern for pedagogy in any period of accelerated growth is the wide individual variations in such a period. Wide variations have been pointed out in various phases of development. Some children reach the accelerated stage of growth at a younger age than others, often decidedly outstripping those of retarded development. This fact has been indicated as the chief occasion for the adoption of physiological age as the criterion of determining the stages of development instead of the traditional chronological age standard. Furthermore, the rate of growth within this accelerated stage varies with individuals. Some pass the period more rapidly and growth is more saltatory than in others. Variability is a chief characteristic in any period of accelerated development.

As Terman has suggested, stages of rapid development render the organism more unstable in general. During rapid growth some parts may grow more than their relative proportions and others may not grow adequately; thus, the harmony of parts of the organism is easily impaired. Hence, particular care should be given the child in his stages of rapid growth and development in order that disturbances occurring may be recti-

fied before the period of rapid growth is past. In such a stage of growth the mental attitude of the child is also apt to show a little less equanimity. These general statements are highly significant in the more rapid stage of growth at puberty, but they are sufficiently true here to warrant attention.

Because of the great variability and of the danger of retardation at this period and perhaps of increasing conditions favorable to disturbances in development, it has been suggested, that school instruction should not begin until the child is at least well into this stage of accelerated development. Physiological age, as our standard, can be applied to the individual to determine his fitness for school occupations. Health examination at school entrance can well determine the fitness of the child to enter school and give additional data of his history which are indispensable in dealing properly with him in school and at home.

Regarding hygienic care and treatment, it cannot be emhasized too strongly that the environment of the child should be adapted as far as possible to his particular stage of development. The importance of recognising the changing stages of development is gradually becoming emphasized. A delay of the accelerated period means a distinct loss to the individual. Various features of development within the stage of transition should receive careful attention. The condition of the teeth, and particularly of the first molars, which have been found most susceptible to disease and onset of microorganisms, should receive careful attention. Likewise, malocclusion of the jaws in this stage is apt to cause injuries to various organic functions. Should there be any difficulty of occlusion, the best time to ameliorate conditions is in this stage of rapid development. The eyes should be carefully guarded in their changing development so as not to incur eye strain or other ocular troubles. The changes in the heart and the facts concerning cardiac incompetence should also put the teacher and parent on guard. Precautions should be taken to avert bad conditions of the tonsils prevalent at the eruption of the first molars. If not, this may become a breeding place of diseases of the teeth, throat, and even of the entire alimentary tract. The rapid changes in motor coordinations should warn us against giving training and work at this period that involve the more delicate neuro-muscular coordinations.

Thus, the fact of transition here seems established, and this connotes a need of particular care to keep the equilibrium of the various parts in relation to one another normal; and, in growth and development of parts, precautions should be taken that all the processes of growth are normal so that the pro-

gressive stages may not be arrested in any one feature of development. It can hardly be accentuated too strongly, that at school entrance, the question of fitness to enter, and the character of the instruction as well, should be determined by the individual child and his particular needs.

Bibliography

1. Abbott, A. C. The Hygiene of Transmissible Diseases. Philadelphia. Saunders and Co.. 1901. 350p.
2. Baginsky, A. Handbuch der Schulhygiene. Stuttgart, Enke (Zweiter Band), 1900. 428p.

2a. Bagley, Wm. C. The Educative Process. New York, Macmillan, 1907. 358p.

3. Baldwin. Bird T. Physical Growth and Physiological Age. 15th Yearbook of National Society for Study of Education. Chicago. University of Chicago Press, pp. 11 to 22
4. —— ——. Physical Growth and School Progress. U. S. Bureau of Education, Bulletin, 1914, No. 10, 215p.
5. Barth, Ernst. Einführung in die Physiologie, Pathologie und Hygiene der menschlichen Stimme. Leipzig. 1911. 507p.
6. Bean, R. B. The Eruption of the Teeth as a Physiological Standard for Testing Development. *Ped. Sem.*, Vol. 21. No. 4, 1914, pp. 596-614.
7. Beik, Arthur K. Physiological Age and School Entrance. *Ped. Sem.*, Vol. 20, No. 3, 1913. pp. 277-321.
8. Bell, Sanford. An Introductory Study of the Psychology of Foods. *Ped. Sem.*, March, 1904. pp. 51-90.
9. Boas, Franz. Growth. Monroe's Cyclopedia of Education. Vol. 3. New York, Macmillan. pp. 187-190.
10. Boas, F. and Wissler, Clark. Statistics of Growth. Washington, Government Printing Press, 1905. 132p.
11. Bowditch, H. P. The Growth of Children. Report of Mass. State Board of Health. 1877, pp. 275-309. 1879, pp. 35-62. 1890, pp. 479-522.
12. —— ——. The Growth of Children. American Statistical Association. Boston, 1894, Vol. 4, pp. 65-102.
13. Bryan, W. L. On the Development of Voluntary Motor Skill. *Amer. Jour. of Psychol.*, Vol, 5, No. 2, Nov., 1892. pp. 125-204.
14. Burgerstein, L. Gesundheit und Nachwuchs. Berlin, Springer, 1914. 35p.
15. —— ——, und Netolitzky, A. Handbuch der Schulhygiene. Leipzig, Barth, 1912. 548p.
16. Burk, F. From Fundamental to Accessory in the Development of the Nervous System. *Ped. Sem.*, Vol. 6, 1898, pp. 5-64.
17. —— ——. Growth of Children in Height and Weight. *Am. Jour. of Psychol.*, Vol. 9, 1898, pp. 253-326.
18. Burnham, W. H. A Health Examination at School Entrance. *Ped. Sem.*, Vol. 21, 1914, pp. 219-241.
19. —— ——. Health Inspection in the Schools. *Ped. Sem.*, Vol. 7, 1900, pp. 70-94.
20. —— ——. Health Examination at School Entrance. *Jour. of Amer. Med. Asso.*, Vol. 68, 1917, pp. 893-899.

20a. —— ——. Mental Hygiene and the Conditioned Reflex. *Ped. Sem.*, Vol. 24, Dec., 1917, pp. 449-488.

20b. CAMERER, W. Ernährung des Kind. In Das Buch vom Kinde, Edited by Schreiber, A. Leipzig und Berlin, Teubner, 1907, pp. 48-50.
21. CHAMBERLAIN, A. F. The Child: A Study in the Evolution of Man. New York, Scribners, 1903. 495p.
22. CHRISTOPHER, W. S. The Three Crises in Child Life. *Child Study Monthly.*, Vol. 3, 1897, pp. 324-335.
23. CONRADI, EDWARD. Psychology and Pathology of Speech Development. *Ped. Sem.*, Vol. 2, 1904, pp. 328-380.
24. CRAMPTON, C. WARD. Anatomical or Physiological Age versus Chronological Age. *Ped. Sem.*, Vol. 15, 1908, pp. 230-237.
25. —— ——. Influence of Physiological Age upon Scholarship. *Psychol. Clinic.*, Vol. 1, 1907-8, pp. 115-120.
26. —— ——. Physiological Age: A Fundamental Principle. *Amer. Phys. Ed. Rev.*, Vol. 13, 1908, pp. 144-154, 214-227, 268-283, 345-358.
27. —— ——. Pubescence: A Preliminary Report. *Amer. Anthropologist*, Vol. 6, No. 5, 1904, pp. 705-709.
28. —— ——. The Significance of Physiological Age in Education. International Congress on Hygiene and Demography, Vol. 3, 1912, pp. 224-236.
29. CUNNINGHAM, D. J. Text-book of Anatomy. New York, Wood and Co., 1909. 1427p.
30. DECROLY, O. AND DEGARD, MLLE. Observations on the Development of Color Sense. *Child Study*, Vol. 5, 1912, pp. 103-107.
31. DICK, J. LAWSON. On the Incidence of Rickets in School Children. *School Hygiene*, Vol. 7, No. 2, May, 1916, pp. 81-89.
32. —— ——. The Teeth in Rickets. *School Hygiene*, Vol. 7, No. 4, 1916, pp. 147-157.
33. DIX, G. H. Child Study with Special Application to the Teaching of Religion. New York, Longmans, Green and Co., 1915. 134p.
34. DONALDSON, H. H. The Growth of the Brain. New York, Scribners, 1895. 374p.
35. DUMVILLE, BENJ. Child Mind. London, Clive, University Tutorial Press, 1913. 214p.
36. ENGLESPERGER, A. UND ZIEGLER, O. Beiträge zur Kenntniss der Physischen und Psychischen Natur des Sechsjährigen in die Schule Eintretenden Kindes. *Experimentelle Pädagogik*, Vol. 1, 1905, pp. 173-235.
37. FOSTER, W. L. Physiological Age as a Basis for the Classification of Pupils Entering High Schools. *Psychol. Clinic.* Vol. 4, 1910-11, pp. 83-88.
38. GUNDOBIN, A. P. Die Besonderheiten des Kindesalters. Berlin, Allegemeine Medizinische Verlagsanstalt. 1912. 592p.
39. GUTZMAN, HERMAN. Die Störungen der Sprache von Kussmaul. Leipzig, Vogel, (Vierte Auflage). 1910. 409p.
40. —— ——. Physiologie der Stimme und Sprache. Braunschweig, Vieweg und Sohn. 1909. 208p.
41. HALL, PRESIDENT G. S. Adolescence. New York, Appleton. 1904. 2 Vol.
42. —— ——. Aspects of Child Life and Education. Boston, Ginn and Co. 1907. 326p.
43. —— ——. Contents of Children's Minds on Entering School. *Ped. Sem.*, Vol. 1, No. 2, June, 1891, pp. 139-173.

44. HARTWELL, E. M. Report on Physical Training in Boston Schools. Boston, Rockwell and Churchill. School Document, No. 8. 1894. 151p.
45. —— ——. The Application of Laws of Physical Training to the Prevention and Cure of Stuttering. Proceedings N. E. A. 1893. pp. 739-749.
46. HOLT, L. EMMETT. The Diseases of Infancy and Childhood. New York, Appleton. 1899. 1117p.
47. HUMPHREY, G. M. On the Growth of the Jaws. Trans. Cambridge Phil. Soc., 1871, Vol. 2, pp. 1-5.
48. JASTROW, JOSEPH. Fact and Fable in Psychology. New York, Houghton Mifflin Co. 1900.
49. JONES, WM. H. The Necrodontitic Hypothesis. *School Hygiene,* Vol. 7, No. 1, Feb., 1916, pp. 21-28.
50. KIRKPATRICK, E. A. Fundamentals of Child Study. New York, Macmillan, 1915. 384p.
51. —— ——. The Individual in the Making. New York, Houghton Mifflin and Co., 1911. 339p.
52. KUSSMAUL, A. Die Störungen der Sprache. Leipzig, Vogel, 1885. 299p.
53. LANDOIS, L. Text-book of Human Physiology. Philadelphia, Blakiston's Sons Co., 1905. 1027p.
53a. MEUMANN, E. Vorlesungen zur Einführung in die Experimentelle Pädagogik. Leipzig, Engelmann, 1911. 725p. Zweite Auflage.
54. MINOT, CHAS. S. The Problem of Age, Growth and Death. New York, Putnam and Sons, 1908. 280p.
55. PEARSON, KARL. On the Relationship of Intelligence to Size and Shape of Head and to other Physical and Mental Characters. *Biometrika,* Vol. 5, 1906-7. pp.105-146.
55a. PERLIN, ANNA. Beitrag zur Kenntniss der Physiologischen Grenzen des Hämoglobingehaltes und der Zahl Blutkörperchen im Kindesalter. Jahrbuch für Kinderheilkunde. 1903. pp. 549-571.
56. PORTER, W. T. The Growth of St. Louis Children. *Amer. Statistical Association,* 1894. Vol. 4, pp. 58-64.
57. PRYOR, J. W. The Chronology and Order of Ossification of the Bones of the Human Corpus. *Bulletin of State University,* Lexington, Ky. 1908.
58. QUAIN. Anatomy—Edited by Shäfer, Symington and Bryce. *Osteology and Arthrology,* Vol. 4, Part 1. New York, Longmans, Green and Co. 1915. 329p.
59. RIAL, D. W. The Control of Measles. M. A. Thesis (Typewritten Ms.), Clark University. 1916. 114p.
60. ROTCH, T. M. Roentgen Ray Method Applied to Grading of Early Life. Proc. 4th, Cong. Amer. Sch. Hygiene Asso. Indianapolis, Indiana, Mar., 1910, pp. 184-204. Also in *Amer. Phys. Ed. Rev.,* June, 1910, pp. 396-420.
61. —— ——. The Labor and Work of Children should be Adapted to the Individual. Trans. 15th International Congress on Hygiene and Demography. Washington, Gov. Printing Office, 1913, pp. 975-984.
62. SCHMIDT, F. A. Unser Körper. Leipzig, Voigtländer, (Zweite Auflage). 1903. 643p.
63. SELTER, H. Handbuch der Schulhygiene. Dresden, Steinkopff. 1914. 759p.
64. SLAUGHTER, J. W. The Growth of Imagination. *Child Study,* Vol. 2, 1909, pp. 105-111.

65. SMITH, THEODATE L. Childhood. *Psychol. Bulletin,* Vol. 10, No. 10, Oct., 1913, pp. 377-397.
66. STEINHAUS, F. Welche Anforderungen sind in körperlicher und geistiger Beziehung in der Schulneuling zu stellen? Zeitschrift für Schulgesundheitspflege, Vol. 26. Beiheft, 1913, pp. 16-75.
67. TANNER, AMY E. The Child: His Thinking, Willing and Doing. New York, Rand McNally and Co., 1915. 534p.
68 TERMAN, L. M. The Hygiene of the School Child. New York, Houghton Mifflin and Co., 1914. 417p.
69. —— ——. The Measurement of Intelligence. Boston, Houghton Mifflin and Co., 1916. 362p.
70. THIELE, A. Versuch einer Biologie der Schulanfänger. Zeitschrift für Schulgesundheitspflege, 1913. Vol. 26, No. 6, pp. 377-386. No. 12, pp. 827-837.
71. THORNDIKE, E. L. Notes on Child Study. New York, Macmillan. (Second Edition). 1903. 181p.
72. TOPINARD, PAUL. Anthropology. London, Chapman and Hall. Phila., Lippincott. 1878.
73. TRACY, F. Psychology of Childhood. Boston, Heath and Co. 1909. 219p.
74. TYLER, JOHN M. Growth and Education. Boston and New York, Houghton Mifflin and Co., 1907. 294p.
75. WELCKER, HERMANN. Kraniologische Mittheilungen. Archives für Anthropologie. Vol. 1, 1866, pp. 89-160.
76. WEST, G. M. Growth of Body, Face and Head of Worcester School Children. *Science,* Vol. 21, No. 518, Jan., 1893, pp. 2-4.
77. —— ——. Growth of the Face. *Science,* Vol. 18, No. 439, July, 1891. pp. 10-11.
78. WHIPPLE, GUY M. Manual of Mental and Physical Tests. Baltimore, Warwick and York, 1910. 534p.
79. WINCH, W. H. When Should a Child Begin School? Baltimore, Warwick and York, 1911. 98p.
80. ZSIGMONDY, OTTO. Veränderungen des Zahnbogen bei der zweiten Dentition. Archives für Anatomie, 1890. pp. 367-390.

THE HEALTH HABITS OF THE TEACHER*

By Thomas A. Storey

The health habits of the teacher are notoriously bad. I am not concerned to-day with a discussion of the reason why. You know that the health habits of the teachers are bad and I know that they are bad. No explanation is needed here.

School people and philosophers interested in educational progress have proclaimed for more than two thousand years that health is of fundamental importance to the achievement of the best that is possible in all human effort. But the average teacher and the average philosopher even to-day, like the average human in general, takes but little trouble to inform himself concerning the laws of health, and takes less trouble to practice these laws.

Because of their bad health habits, teachers are sick more than they ought to be, and on the average die younger than they should.

We teachers are more commonly accustomed to spend time and attention in the examination and care of plants and pets—a rose bush or a canary bird—than we are to spend time and attention in the examination and care of our bodies and their important organs.

We are more regularly concerned over the living things—the insects, scales and other parasites—that destroy the chestnut tree, the spruce, or the potato plant, than we are in the practice of health habits that protect our own bodies from the living and the inanimate things that injure human health.

We may look after the daily lives of our grain fields, our orchards, our farm stock, or our household pets, but we teachers, like most other people, are very likely to form our own daily habits without any particular thought or definite plan. We eat our meals in a hurry, we give our dyspeptic forming dispositions full freedom, we don't exercise unless we have to, we have forgotten how to play, and we purchase our recreation and rest at a movie show where we may be entertained with the least amount of effort on our part.

Truly these are health habits of which no one can be proud.

Two hundred years ago, the average age at death among

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the civilized nations of the world was twenty years. To-day the average duration of life is forty years. Life expectancy has been doubled since the eighteenth century.

We live longer and are sick less often nowadays because individuals practice better health habits, and communities practice better health habits. Wherever groups of human beings have come together, as they do in our modern communities, and spend money wisely and sufficiently and habitually for clean safe food, for clean water, for the effective disposal of sewage, for the provision of parks and playgrounds, for the medical inspection and care of school children, and for those other health protecting agencies that are essential to the practice of wise community health habits, the result has been a reduction in the amount of sickness and a reduction in the occurrence of postponable death.

And in like manner, the individual who practices wise health habits, protects his health and prolongs his life. The human being who practices intelligent habits of bodily care and bodily repair; reasonable habits of protection against the agents that injure the body and destroy health; and practices wise habits of nourishment, excretion, exercise, recreation and rest, is bound to live longer, live happier and live more usefully. And so my advice to you to-day, and I am here, as I understand it, for the purpose of giving you some general advice concerning your health habits, will be submitted to you along these lines.

First, I recommend that you acquire the habit of inquiring with some care into the best literature we have relating to health. Unfortunately, there is an enormous amount of worthless literature on this subject, and it is not easy for us to decide upon the value of many of the books, pamphlets and other publications that are found everywhere. Furthermore, we are forced to revise our judgment as to what is true in the various sciences that are fundamental to hygiene, so that some things we accept to-day we are obliged to discard to-morrow. But in spite of all this, we are in possession of a vast amount of very important, firmly established scientific data upon which we can safely base our laws of health. Among the most easily available sources of information concerning the care of the body and the facts of health are the publications of our various State and Municipal Boards of Health. I am sure that if you communicate with the State Commissioner of Health in Albany, he will send you some very useful literature bearing upon health problems. The Board of Health of New York City, and the Board of Health of Buffalo, issue bulletins and pamphlets that are of great value along these lines.

The United States Public Health Service in Washington publishes a weekly bulletin and issues other literature which I have found frequently contains important and useful practical articles applicable to the everyday life of the average citizen.

The Journal of the Outdoor Life, published at 289 Fourth avenue, New York City, is well worth reading.

Perhaps the best source, and the source from which the most complete information may be secured along the lines we are discussing, is the Life Extension Institute, 25 West 45th street, New York City. This organization issues letters and folders bearing upon the whole range of individual health. I have found these publications very useful and very practical.

My second suggestion is that you establish wise habits for the care and repair of your body. I am convinced that a great deal of sickness and a great amount of postponable deaths would be avoided if men and women would secure regular health examinations once or twice a year. You would be healthier, you would live longer, you would be more useful if you were to secure such examinations and follow the advice given you at such examinations. Care should be exercised to select a reliable physician and a dependable dentist. All physicians are not reliable and all dentists are not dependable. They are no better—and no worse—than school teachers. You must make your selection with care. But having selected your examiner and having secured your examination, you should follow the advice given. Examinations should be repeated once or twice a year.

This examination should be a complete one. Do not be satisfied with the woman or man physician who examines your heart through your clothing. Do not be satisfied with an examination that does not secure for your examining physician an opportunity to observe and examine with intimate care all the important organs of the body; the condition of your blood; the state of your urine; the nature of any long-standing irritations or sores or abnormal growths; or the nature of any unusual excretions or discharges that may be present.

One woman in every seven, past the age of thirty-five, dies of cancer. This terrible ratio would be very largely reduced if the chronic irritations, old sores, or unusual growths, from which cancer develops, were discovered and taken care of before the cancerous development has been given opportunity to establish itself. The sick rate and the death rate from tuberculosis of various kinds is appalling. This disease would be less frequent and its fatal termination less common if our

lungs were given careful expert examinations every six months and we were wise enough to follow the advice given us.

Nervous diseases from defective vision, a great variety of troubles depending upon decayed teeth and root abscesses, heart troubles, kidney troubles, digestive troubles, and a number of other organic degenerations and ailments, would be reduced if human beings were in the habit of securing for themselves expert health examinations and consequent expert advice at regular and appropriate intervals.

In the third place, I would urge you to practice reasonable habits of self-protection against the agents that cause disease and destroy health. I am thinking of the importance of safety first habits in relation to accidents from mechanical, chemical and physical sources. Something like seventy-five thousand people in the United States are killed each year through preventable accidents, and perhaps a million people injured, but not fatally, because of accidents from physical, mechanical or chemical sources, which could be avoided.

Then I am thinking of the whole range of disease-causing organisms that destroy health and destroy life. These are the organisms that cause what we call our 'preventable diseases.'

There are approximately three million people in these United States sick at the present moment with preventable disease. Three million people, some of them losing time from their work, many of them in pain, many of them losing income, all of them causing anxiety, apprehension and fear, and all of them suffering injury from living organisms which may be avoided.

These living things that destroy human life, that injure human health, are carried from one human being to another, either through our carelessness with our respiratory excretions or fecal excretions or our genito-urinary excretions; or by means of blood-sucking insects or insects that breed and feed in human excretions. They may be carried by infected animals which associate with us too intimately or supply us with food.

Our habits of health protection against such agents and carriers of disease—such destroyers of health—must include habits of personal cleanliness, provision for clean food and clean water and clean contacts with other human beings. People should always wash their hands before they eat; they should always wash their hands after the toilet; they should never finger their eyes or care for open wounds without first washing the hands.

We all understand that spitting is a bad habit, but many of us have yet to learn that coughing and sneezing are equally bad habits, unless we cough or sneeze into a handkerchief or a rag and thus prevent the distribution of the disease germs contained in our respiratory excretions.

We should protect our sick from blood-sucking insects and we should keep such insects away from human sewage, so that the insect carriers of disease may not be given an opportunity to spread infection.

In these several ways I can only hastily point out to you the lines along which habits may be developed for the protection of the body and its organs against the agents and carriers of disease.

And finally, I would urge you to practice wise habits for the satisfaction of your bodily needs. I have in mind your habits of nourishment, excretion, exercise, recreation and rest.

I need hardly advise you as to the importance of supplying yourselves with nourishing food, but I am certain that many of you will profit if you follow my advice to cultivate the habit of being cheerful at mealtime. A man or a woman who eats with a grouch is bound to have indigestion. If you go to your meals under the influence of anger, discontent, apprehension, worry, or fear, you will pay the penalty with dyspepsia. Meals should be eaten slowly, food should be well chewed, and the table situation should be cheerful and happy. We have ample scientific evidence to prove the accuracy of these statements.

A great deal of poor health is due to a lack of attention to the bodily excretions. One should drink an average of six or eight glasses of water a day in order to assist the kidneys in their excretory functions. These organs are the most important organs of excretions we possess.

One of the commonest of our bad health habits is our neglect of the fecal excretions. Constipation is responsible for a vast amount of poor health and serious disease. A mother who teaches her child the habit of regular adequate dejection everyday is performing a service which may have an unsuspected but powerful influence upon the longer life and greater happiness of the child. The man or woman who neglects the cultivation of habitual regularity of fecal excretion inevitably pays a health penalty sooner or later. My insistent and urgent advice to you is to establish the habit of full complete evacuation of the bowels every day.

Exercise, recreation and play are just as essential to a whole and complete life as food, air or water. If you want to realize your full health possibilities, if you want to avoid

poor health, if you wish to escape disease, you must have adequate exercise, adequate recreation, and adequate play. The man or woman who spends the day in physical inactivity and fails to turn out a moment of happiness or a flash of joy, cannot escape nervous disease, premature old age and an early discard into the scrap heap. In our early and middle lives, the daily exercise should be enough to produce some sweating and invite a cool or cold bath. The best time to exercise and play, if the play is vigorous, is before meals, rather than immediately afterward. Quiet, cheerful play and recreation may be undertaken at any time.

The average human being seems to need about eight hours' sleep in each twenty-four. Some people do very well on less, while others seem to be in absolute need of a greater amount of rest. Those of you who sleep too little must pay the penalty. The fatigue of one day cannot be removed in time to enable you to meet the demands of the next day if you do not secure sufficient rest. Rest is nature's cure for fatigue.

My advice to you then is—first: establish reasonable habits of inquiry into the facts that bear upon the care of the body and the conservation of health. Second: select your health examiners with care and go to them regularly once or twice a year for a thorough health examination. Third: establish wise habits for your protection against the mechanical, physical, chemical and living agents that injure health and destroy life; and guard against the insect and other carriers of disease. And, finally, establish for yourself wise habits for the purpose of satisfying your physiological needs;—habits of nourishment, habits of excretion, habits of exercise, rest, recreation and sleep.

Don't remain ignorant of the simple, fundamental laws of human health. Inform yourself intelligently.

Don't be ignorant of your own body and its health needs. Be sane about it. Don't worry.

Don't neglect the defense of your health—avoid the agents that injure health and the agents that carry disease.

Don't eat in a hurry; don't eat with a grouch; take a few minutes of cheerful leisure after your meals.

Don't neglect your excretions.

Don't lose your habits of exercise, of play and of active, happy recreation. If you have forgotten how, learn again.

Don't sacrifice your rest.

One thing more: Your health problems are very intimately dependent upon the health habits of the community of which you are a part. No matter how wisely and carefully you devise your own policy of personal health control, you cannot suc-

ceed in your plans for the acquisition and conservation of your own individual health unless the health standards of the community of which you are a part are high. If your community sewage is bad, if your community water supply is polluted, if there are breeding places for malarial mosquitoes in your neighborhood, if there is no supervision over the purity of milk that is brought to your door, or the cleanliness of the meat that your butcher brings you, if you are not protected by quarantine against people sick with infectious disease, your own individual health habits will not save you from the bad habits of your community.

Therefore, it is incumbent upon you not only to practice wise individual health habits yourself but to use your influence in every way you reasonably can to produce wise habits of health in your community. Be ready to vote the right way. Be ready to spend money for the purpose of buying health in your community. Be ready to spend money to teach your school children how to live, and be ready to care for them whatever the cost, so that they may reach maturity with all the health and all the vigor which they deserve.

A combination of wise individual health habits and wise community health habits must inevitably lead to lower death rates, lower morbidity rates and to greater community vigor and health.

APPRENTICESHIP AND ITS RELATION TO INDUSTRIAL EDUCATION

By Paul H. Douglas, Reed College

The most important educational movement during the past decade has been perhaps that toward industrial education. The cause lies in the failure of the workshop to provide proper industrial training for its young employees. In order to understand the present educational situation, therefore, it is imperative to examine the industrial ascendency and the roots from which it has grown, namely, the old system of apprenticeship that formerly provided broad training for the young workers of this country.

Apprenticeship is essentially a combination of education and industry. It is a process of learning by doing, under which a minor is taught the art of a trade by one who is at the moment engaged in it; the minor paying either in whole or in part for this instruction by the work done on objects destined for the master's consumption or sale.

This is a sufficient definition of an institution that was the chief means of trade education until the advent of the machine era. The apprentice differs from the ordinary child laborer in that he not only works for his master but receives instruction in his trade. Apprenticeship ceases when child labor degenerates from education to routine. Since now the shop no longer trains the child worker, other agencies must be created to assume the responsibility.

Apprenticeship can exist, either with or without a legal indenture. In its essence it is a contractual relationship between boy and master, involving an exchange of work for education. The indenture is merely the legal instrument bearing witness to this relationship. The contract itself may be held binding in the absence of any written agreement whatsoever. For instance, a Connecticut court has held that a boy who lived to the age of twenty-one with a mechanic, learning the trade under parole agreement, was an apprentice though there were no articles of indenture existing between the two.[1] Other decisions have been made supporting this view.[2] In

[1] Huntington v. Oxford, 4 Day, 189 (1810).

[2] State v. Jones, 16 Fla. 306. See Niles Register, vol. 59, p. 336 (1840), where record is made of a similar decision by which a boy was sent back to his master, though no written agreement existed.

fact, many of the firms that now have apprenticeship systems do not have formal written indentures binding the two parties, but allow a continuance of the relation upon the pleasure of both. It goes without saying, however, that though the indenture is not synonymous with apprenticeship, it is very valuable as a means of giving needed fixity and definiteness to a relation that might otherwise become too lax.

Apprenticeship originated far earlier than is commonly supposed. The popular belief is that it had its inception in the handicrafts of the medieval town, crystallising in the regulations of the craft gilds. No writer upon economic history, in fact, has placed its beginnings further back than this period. Adam Smith declared: "Apprenticeships were altogether unknown to the ancients. I know of no Latin or Greek word (I might venture, I believe, to assert that there is none) which expresses the idea we annex to the word, Apprentice."[3] This statement by Smith has been freely accepted by writers upon economic history and industrial education. The Encyclopedia Brittanica says: "So far as it can be seen, it (apprenticeship) arose in the middle ages, and formed an integral part of the system of trade gilds and corporations."[4] Recent works upon the subject contain similar statements. One declares that "The modern apprenticeship system has its origin in the medieval handicraft work;[5] another that "the apprenticeship system took its rise in medieval handicraft work."[6] Many similar citations could be given.[7]

As a matter of fact the history of apprenticeship does not stop here. Traces of it are found in the very dawn of civilization. The Babylonian Code of Hammurabai (2100 B. C.) recognizes and regulates apprenticeship in the following terms: "If an artizan take a son for adoption and teach him his handicraft, one may not bring claim against him. If he do not teach his handicraft, that adopted son may return to his father's house."[8] Aside from proving once more that there is nothing new under the sun, this voice from the past is significant in several respects. In the first place, the fact

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See also H. G. Wood, "A Treatise on the Law of Master and Servant," p. 52: "When the parties to a contract are bound thereby, one to teach and the other to learn and serve at a certain trade or business, it is a quasi contract of apprenticeship, whether in writing or by parole."

[3] Smith: "The Wealth of Nations" (Cannan edit.), vol. 1, p. 124.

[4] 1910 Edition, vol. 2, p. 229.

[5] J. L. Taylor: "A Handbook of Vocational Education," pp. 138-139.

[6] Bulletin 19, U. S. Bureau of Education, 1913.

[7] Among these may be cited: Labatt's "Master and Servant," vol. 6, p. 6384.

[8] The Code of Hammurabai (Harper trans.), p. 74, rules 188-189.

of codification proves that apprenticeship was even then in an advanced state of development and had probably already existed for a considerable period of time. Secondly, it appears that the status of master and apprentice was that of father and son, a blood fiction being created. The term of apprenticeship, furthermore, lasted apparently for life. The apprentice leaves his father's house to go to that of the master; if the master teaches him, he stays. Finally, there is indication of state supervision over the relations of master and apprentice, since the master is required to teach the apprentice his trade without the right to exploit him as boy labor. Among the Greeks, the existence of apprenticeship is witnessed to by references of several writers. Plato plainly refers to it in "The Republic."[9] Xenophon says it is "Just as necessary as when a man puts his son out to apprenticeship to be trained that a contract should be made concerning what the son should know."[10] Thus, the existence of apprenticeship is not only established, but there is evidence that it was regulated by agreements between the master and the father of the apprentice. Modern classical scholars have indeed accepted apprenticeship as an essential factor in the economic life of Athens.[11]

Apprenticeship was furthermore present under the Roman Empire. Lucian mentions that he was apprenticed to his uncle to learn sculpturing, but that he broke his contract and ran away.[12] Professor Westermann has recently translated several indentures that give an idea of the conditions of apprenticeship in Roman Egypt.[13] According to these contracts, the artizan gave trade instruction, plus other considerations, to the apprentice in return for the apprentice's labor.

Some of the masters practised the trades of weaving, shorthand writing, flute-playing, hairdressing, and nailsmithing. The time of service for these trades varied greatly. In the weaving trade, the indentures provided for a term of from

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[9] Plato, "The Republic," book IV, Spens. translates, "His sons and those others whom he instructs;" Jowett translates, "His sons and apprentices." Jowett, Dialogues of Plato, vol. III, p. 109, The word translated is—*δημιουργούς* or demiourgos.

[10] Xenophon: De Re Equestri, 2.2.

[11] See for example Zimmern: "The Greek Commonwealth," especially the chapter on "City Economics: Craftsmen and Workmen," pp. 255-276; also L. F. Anderson, "Some Facts Regarding Vocational Training Among the Ancient Greeks and Romans," *School Review,* vol. 20, pp. 191-201.

[12] Lucian: The Dream, Dakyn's trans.

[13] W. L. Westermann: Classical Philology, vol. XI (1914), pp. 295-315; also an article by the same author, "Vocational Training in Antiquity" in the *School Review,* vol. 22, pp. 601-610.

one to five years, with indications that a three-year period was the one most commonly required. A boy apprenticed to a flute player had to pay a money subsidy to the master, probably because his labor would be worthless. In weaving, on the other hand, it was the master who paid the apprentice. A compensation for clothing was allowed, and money wages not only were paid to the guardian or parent during a part of the third year of service but also for such period thereafter as the apprentice might serve. The wages were progressively graduated according to the length of the contract. The apprentice, furthermore, does not appear to have lived with the master, but to have boarded at home; in return for which the master made an additional money allowance to the parent of the boy.

It is apparent that there was no fixed term of service or rate of wages, these matters being settled by individual contract. The state's interest was confined to levying taxes upon apprentices and to inflicting fines in cases of broken contracts. All the apprenticeship regulations, moreover, were confined to the provisions of the common law. None of the codes made specific inclusion of them.[14] It is undoubtedly this absence from formal Roman law that has led jurists and economic historians to deny the very existence of the apprenticeship institution.

That the institution is of ancient origin, should not, however, excite much surprise, for it is obviously the normal correlative of handicraft labor. Whenever industry has developed beyond the family as a self-sufficing entity, separate trades arise from which the artizan must derive the whole or a part of his living. The growth of the industry must in many cases entail more work than can be done by the sons alone. Other boys must be taught the trade, not only to insure skilled workmen, but also in some cases to provide continuity in its management. The inevitable result is apprenticeship.

The system of apprenticeships has been used to prepare men for all forms of industrial and professional work rather than for the manual crafts alone.[15] It cannot be repeated too often that apprenticeship is basically a process of learning by doing.[16] It is a higher form of the trial-and-error process,

[14] Professor Westermann states that the codes of Justinian and Theodosius seem to indicate a continuation of the apprenticeship system with governmental regulation for the purposes of taxation together with greater rigidity in the heredity principle of choosing a trade.

[15] Among the Greeks there was no distinction between what we now designate as trades, crafts, arts, and professions. All alike were given the same name: Techne.

[16] The educational nature of apprenticeship is seen from the French and German equivalents of the term. The French word is apprentis-

containing a large amount of imitative motion. As such, it quite naturally antedates all theoretical instruction.

The avenue of entrance to all professions formerly lay through apprenticeship. Until recent years lawyers were almost predominantly trained in law offices by practising attorneys.[17] Even to-day, despite the multiplicity of law schools, many attorneys are educated by this purely "prentice-like" practise.[18] Dentists and doctors have in the past been trained by similar methods. Indeed, as Mr. Flexner points out, English medical schools are but an outgrowth of the pooling of apprentices whom individual doctors have taken with them in their rounds through the hospitals.[19]

As medieval universities were controlled either by gilds of students or by gilds of teachers, graduation from the student ranks meant at first only entrance into the rank of teacher. Just as the medieval silversmiths, coopers, and other craftsmen were compelled to produce a "masterpiece" as evidence that they had successfully completed their apprenticeship and were qualified to become full-fledged journeymen, so too was the student compelled to produce his original piece of work for graduation. The dissertation of the modern doctor of philosophy is a vestigial remain of this institution.

Chivalry itself was but a species of handicraft. A boy having served seven years as page and seven years as squire was then admitted with attendant ceremony to the rank of knight. These steps were perfectly analogous to the stages of apprentice, journeyman, and master craftsman, through which the artizan passed.

In recent times pedagogy has also been taught by the method of apprenticeship. In 1846 the pupil-teacher system was introduced into the London schools to succeed the Lancastrian or monitorial system. Boys and girls were apprenticed to the head teacher, assisted him in his work; received instruction (which was generally given at the breakfast hour) and were paid a small but increasing wage for their labor. This practice was plainly nothing but apprenticeship. The teacher-apprentices were supposed to be not less than thirteen years of age, but in many cases they were still younger. The London County Council in 1875, wishing to reform the situation, stipulated that no pupil-teachers would be accepted who were less than fourteen. In 1869 there were two apprentices for every

sage; the German, lehrzeit, springing respectively from the stems, apprendre and lehren, to learn.

[17] See Redlich, "The Case Method in American Law Schools" (Carnegie Foundation), p. 7.

[18] Idem, p. 7.

[19] *The Atlantic Monthly*, Oct. 1915, p. 528.

teacher. This indicates that the teaching profession was not only poorly manned, but that apprentices could not be sure of final opportunity to serve as full-fledged teachers. Even in London to-day the art of teaching is imparted in this fashion. The relative number of apprentices has, however, decreased. In 1904 the ratio was one apprentice to every four masters, while the instruction formerly given by individual masters is instead given in normal schools.[20]

Though apprenticeship has been the generic form of education for all these professions, the old imitative, empirical method of education has been largely or wholly replaced by school training. Whenever a trade, craft, or profession has developed to such a stage that general principles and scientific causation can be abstracted from personal contact, then apprenticeship as the sole or chief method of training for that occupation declines. That which was an art becomes a science with more or less fixed rules and a generalized method of procedure. In our day, we have seen schools of finance and administration invade the art of business management, promising to revolutionize the functions of the entrepreneur, and make business a science.

Will this movement from the system of apprenticeship to school training, which has been so characteristic of the professions, take place in the manual arts as well? Will bricklaying and carpentry be taught in the schools in the future as medicine and law are now, rather than on the job? This question is indeed an open one, but it is extremely doubtful if the school can ever replace the shop as the chief method of training manual workers. Even in the professions, abstract instruction alone has been found inadequate; young lawyers must become clerks in offices, doctors must serve as internes in hospitals. In industrial pursuits the case for shop training appears even stronger. The content of the various trades cannot easily be given elsewhere than in the industry itself.

Another function of apprenticeship is the development of character and good citizenship. Originally it was a preparation for life, not a preparation for technical pursuits alone[21] The English gilds formerly acted as the moral and educational supervisors of the apprentice—among other things, in some cases requiring church attendance—and this theory of the social nature of apprenticeship existed long after the gild

[20] Final report, London School Board, 1870-1904, pp. 138-146.

[21] See R. A. Bray's view of the essence of apprenticeship,—"Originally the term apprenticeship was employed to signify not merely the practical training in the mysteries of a trade, but also that wider training of character and intelligence on which depends the real efficiency of the craftsman." "Boy Labour & Apprenticeship," p. 1.

form of organization decayed. Peel's child labor law of 1802 was entitled, "An Act for the preservation of the health and morals of the Apprentices and others employed in cotton and other mills and cotton and other factories."[22] This law stipulated that educational training should be given every day with religious instruction "one hour every Sunday."

The apprenticeship regulations of the colonies furnish ample proof that this conception of apprenticeship held in America as well as in England. The statutes of nearly all the colonies provided that the apprentice should be taught to read and write, should be given biblical instruction (Massachusetts compelling church attendance) and that the master must be a moral man. Should the master violate any of these provisions, the apprentice was to be freed from his contract. The system was designed, as far as the isolated life of the times permitted, to prepare the apprentice for society as well as for his trade. Nor should it be forgotten that the state assumed supervision over the apprentice until he reached the age of twenty-one, in some cases, twenty-four. At the present time the states, with few exceptions, disclaimed any responsibility for the child over fourteen. In our far more complex life with its many dangers to adolescence, we are turning children loose from seven to ten years earlier than in colonial times.

Apprenticeship has frequently resulted in a semi-servile status which contrasts curiously with its protective features. The relation of the apprentice is at best a dependent one, and in primitive states of society it may readily take on some of the aspects of slavery. Among many of the Southern colonies, notably Virginia and South Carolina, the same laws were made applicable to negro slaves and to white apprentices.[23] A study of the methods by which the various states manumitted the slaves within their jurisdiction, shows that apprenticeship was a half-way stage between slavery and complete freedom. In the slow social evolution which the Pennsylvania negro experienced, he passed through the state of apprenticeship on his way to freedom. The abolition act of 1780 commuted the term of servitude to a term of apprenticeship under the old masters of the former slaves.[24] New Jersey and Illinois followed a similar plan.[25]

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[22] 42 Geo. III, c. 87.

[23] See Henning, "Virginia Statutes," vol. 3, pp. 446-47: "An Act Concerning Servants and Slaves."

[24] See E. R. Turner: "The Negro in Pennsylvania," pp. 89-108.

[25] The New Jersey act of 1846 simply substituted apprenticeship for slavery. See H. S. Cooley, "A Study of Slavery in New Jersey," pp. 28-31. The census of 1850 enumerates several hundred New Jersey

A parallel proposal was made by the Prussian landowners when the "hereditary subjection" was about to be removed. Cuba, in freeing her slaves, pursued an identical policy.[26] When England freed her slaves in 1831, the colonial government re-committed the freedmen in the West Indies to a term of apprenticeship; owners being metamorphosized into masters. The evils that followed the creation of this new status were every whit as bad as those of the previous era. Men and women were flogged to death, and the barbarous cruelties that were practised show that in the West Indies, at least, the rhinoceros whip and other appurtenances of slave discipline were as active and as powerful under apprenticeship as under slavery.[27]

It is very interesting to note that Abraham Lincoln, during his first term in Congress, introduced a bill for the freeing of the slaves in the District of Columbia, that provided a temporary system of apprenticeship for them.[28] It was indeed the enactment of apprenticeship codes by some of the southern states after the Civil War[29] (codes which provided for a more or less permanent semi-servile status of the newly-freed negro) that was the immediate cause of the harsh measures of reprisal undertaken by the North upon the South. The leaders of the radical northern movement charged that slavery was being again set up in the South under a different guise.[30] Whether many of these nominal "apprentices" received the training necessary to constitute *bona fide* apprenticeship is, of course, extremely doubtful. The legal fiction of apprenticeship was however maintained.

The reasons for this curious use of apprenticeship are simple. It is dangerous for the slave to be suddenly transposed from slavery to freedom. The freedman is disposed to idle away his time. This means the disorganization of the working force of the former master. The former owners moreover feel that they are entitled to compensation. If

blacks who were legally "apprentices." For the process in Illinois see N. D. Harris. "The History of Negro Servitude in Illinois," pp. 6-103.

[26] H. H. S. Aimes, "Transition from Slave to Free Labor in Cuba," *Yale Review*, vol. XV, pp. 68-84.

[27] William Bevan, "Operation of the Apprenticeship System of the British Colonies" (published in 1837), pp. 35, ff, gives a striking account of the system.

[28] Strunsky: "Abraham Lincoln," p. 68.

[29] Notably Alabama, Louisiana, and Mississippi. For a southern account, showing the alleged necessity for a more permanent labor force, see Hilary A. Herbert's "Why the Solid South?"

[30] See, for instance, James G. Blaine's "Twenty Years in Congress," vol. 2, pp. 94-103.

money is denied them, they claim further service from their former slaves.

The legal theories of apprenticeship have naturally changed with the successive forms of its constitution. In Babylon, as we saw, the relation of master and apprentice was that of father and son—apparently a relation of permanence. All the potential harshness of the *patria potestas* (to use an anachronism) accompanied this relationship. By the time of Roman Egypt, apprenticeship had developed into a contractual state of fixed stipulations under which the apprentice received a money reward as well as instruction. He became, in a word, a wage-earner. This change of status weakened the concept of filiality. In the Middle Ages apprenticeship became a matter for corporate control upon the part of the gilds. The master had now become the temporary guardian, not the parent, of the apprentice. But though the apprentice is not the property of the master, his term of service is. The unexpired serving time of the apprentice is an economic asset of the master and could, under certain conditions, be sold or bequeathed. This constitutes property in time if not in persons.

With the coming of the machine era, the length of the period of service was shortened. Industry did not now require protracted service on the part of any individual. Master and apprentice now stand in the capacity of friends who can terminate their relation at pleasure. Two main tendencies appear in this development: (1) The movement from a personal to an impersonal basis, (2) the decrease in length of service, beginning with a lifetime and ending in some cases with but a few months.

The problems presented by the decadence of apprenticeship are not peculiar to America alone. Great Britain has seen child labor robbed of its former educative qualities, and become largely routine drudgery. France, after abolishing the gilds in 1791 felt the need of skilled training, and some of the best analytical studies of modern industry have resulted from her knowledge of that need.[31] Germany as we all know, has met the problem better than any other nation. She has accomplished this through her perpetuation of the gilds as the super-

[31] Some of the more important recent studies are: Charles Berteaux: "La Crise de l' Apprentissage en France" (1909) Gustav Dron, "Proposition de loi sur l' organization de l' apprentissage, par les cours professional" (1911) Constant Verlot, "Rapport fait au nom de la commission du commerce et de l' industrie sur le projet et les propositions de lois relatif a l' enseignement technique industrial et commercial." (1912.) Also two governmental studies, "Rapport de l' apprentissage dans l' industrie de l' horlogerie" and "L' Apprentissage industriel."

visors of trade education and through her system of compulsory attendance in continuation schools. Italy and Switzerland have experienced the same difficulty. Industrially backward countries, such as Austria[32] and countries newly inducted into the machine process, like Japan, face parallel situations.

Wherever the old hand process has given way to machinery, wherever the division of labor has been greatly extended, there the old system of apprenticeship has broken down. With it the training of the boy in industry, both for the industry and for life itself, becomes more and more difficult. The problem of the future is to devise a system which will modernize the good features of the former system and add to them merits which it did not formerly possess.

[32] See August Liwehr, "Die Lehrlingsfrage in der Grossindustrie," Oesterreichische Rundschau, vol. 36, pp. 199-201. (1913.)

NEW EDUCATIONAL DUTIES OF OUR TIME*

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Translated by Helen M. Downey

The treatment of the world-war in school presses upon the pedagogue as an inevitable obligation. We must not only assist youth to a right attitude toward all the staggering daily events, and show it how it may acquire therefrom the proper subjective advantage, but must utilize, as a more deeply penetrating influence on character and inner life, the serious and susceptible mood which is generated by all the stirring impressions.

In this connection one can distinguish three main pedagogical tasks in the treatment of the war-theme: first, exposition of the ethical values of the war; second, the obviation of the dangers which may arise for youth from the various impressions from the theater of war; third, the direction of the attention of the young generation beyond the world-war effects, which are separating nations, to the inevitable reconciliation of the peoples and the moral tasks arising therefrom.

As for the first-named task, the most obvious ethical value of the war lies, of course, in the stimulation of *public spirit* and of *love for the Fatherland* by the inspiring sight of tremendous, concerted action in which the superindividual life of the nation, borne by the heroic readiness for sacrifice on the part of millions of people, becomes a phenomenon which sweeps one along and drags the individual irresistibly from his isolation. The *social-pedagogical* task of setting forth in full this anti-egoistic effect of the war is, of course, the simplest because it is supported most directly by the elementary impressions of the day. It has rightly been proposed, from the pedagogical side, to arrange "*war-hours*" (the last school-hour on Saturday) in order to create a point of concentration for all such national-pedagogical effects; the older classes are to be assembled at that time and the individual pupils can give a survey of war-events; others make reports on the special heroic deeds which have been announced in the newspapers or in letters from the front; the younger children may quote poems; finally the teacher is to select some gripping theme from the events of the week. It is doubtless right that in these days

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the school should lift the feelings of the individual from isolation and create for all individual thoughts and feelings an ordered, collective expression in which the individual feels and is kindled with enthusiasm, not as an individual, but as a nation and "chorus." The task of the teacher, or of individual pupils who are thoroughly prepared for it, would then be to deepen the newly-awakened historical and ethnological interest by accurate, and condensed accounts, perhaps by orientating surveys of England's colonial or economic history, of the history of Alsace, of the Baltic provinces, of the Polish kingdom, of Turkey, of the Belgian Congo State, etc. or of the peoples of Austria and the Balkan States. A report by the teacher on Islam in Africa and Asia would also arouse lively interest just now.

A more personal effect and one striking at the essence of character can be exercised if the teacher turns from the national, collective action to its individual supporters and from the aspect of the heroism of the individual tries to draw not only moral stimuli, but also quite concrete suggestions for imitation in school and home.

However one judges the total balance of the war, and whether or not one considers its destructive, greater than its constructive effects,—the fact remains indisputable that war has always formerly been regarded as a high-school of the heroic ideal; it has vigorously maintained the *consciousness of unconditional obligations* and every kind of *disciplinary severity* as against softness and egoism—and this very imposing object-lesson which proceeds from the military heroism of sacrifice and obedience should again be made fruitful in every way for youth, and, of course, always in connection with definite examples, which can then be turned to good account as parables for all life. Thus, for example, a letter from the front describes the following scene in a hospital:

"During the operation, which took place in a church arranged as a hospital, a bomb crashed through the church window above. Some of those assisting at the operation instinctively jumped aside, others disappeared under the operating table and others tried to save themselves by hasty flight into the sacristy or behind the altar. The shell-splinters and stones clattered through the church windows, pieces of stained glass and of roof-ornamentation rattled down on the reddish floor-stones. 'Here we are operating!' said the surgeon unconcernedly; an energetic, 'Each one remains at his post!' from the assistant quickly caused the people under the table and behind the altar to hurry forth. Calmly, as if we were in the operating room of a hospital, we worked ahead, looked for

ducts, nerves, applied ligatures and sewed muscle after muscle to a useful stump. After the ligature the patient opened his eyes again soon, and murmured softly and contentedly, 'Ah, how well I have slept!' He would scarcely believe that he had already been operated on and that, in the meanwhile, almost the whole church had been destroyed. Astonished and amazed he looked at the ruined church windows. We laid him carefully on soft straw and while the hostile missiles thundering outside completed their work of destruction, he was already sleeping along toward recovery with deep, calm breathing."

Such a narrative, which has special value because it deals with unwavering courage in wound-healing, not in wound-inflicting, is quite especially adapted to give deep stimulus to the inner life—but, of course, only when one calls attention to it not merely as a sensational anecdote, but passes immediately to the question, "How is such character to be developed, character that does not allow itself to be deterred from the fulfilment of duty by any fear of death? Will a man who allows himself to be called from work by every passing bird, every street noise, every tooth-ache, or any fancy be capable of remaining and calmly finishing his task during bomb-attacks or will he not rather belong with those who creep under the table? Accustom yourselves always, even in the smallest task, to think of all the great things that are thereby accomplished or abandoned—desertion and heroism are not first determined on the battlefield, but in every commission, in every arithmetic problem. Now in youth you have Hercules' choice before you, the choice between inconstancy and loyalty, between persistency and desertion, conscientiousness and pleasure-hunting." The great character-forming posibilities of the war lie in the very fact that all those *inspiring, collective accomplishments of discipline* now bring quite new inspiration even to laborious, dry, dull loyalty and self-control in everyday matters; all the forces of character which have won an entirely new glory through the brilliance of their successes from the point of view of world-history thereby preserve, even in school-youth, an entirely new vigor and can therefore be appealed to as an effective motive for everyday victories and exercise of duty. Thus, in the following way, among others, one might speak of the *miracles of discipline* and thereby illuminate the dry school-regime from the war horizon:—

"When first the news of mobilisation was posted on all the street corners, when the first dispatches came, 'The Russians in East Prussia' many a one thought with anguish, 'What will come of it? Are we really equal to an attack from three

sides? Shall we not be crushed?' Then the barracks opened their gates, and troop after troop marched to the station with firm tread and stride, ready for action; nowhere was there even one scene which bespoke perplexity, disorder, lack of punctuality; the whole tremendous preparation proceeded like a dress-rehearsal; no one seemed excited and nervous—everyone knew where he belonged and what he had to do, and that the others would do their parts—and then there suddenly came over all an absolute peace and confidence; it was known that this entrainment there at the station was only a small picture of how, in the large, everything was premeditated and arranged and how everywhere plan and execution tallied.

"Whoever is mindful of what marvels German order, punctuality and accuracy are accomplishing in this war and of how troops far superior to ours in number could not withstand the attack of our troops, will here observe again in a large and inspiring picture, how only the power which is acquired by discipline and which disciplines itself is worth anything, and how world-conquering strength is harvested from years of loyalty on a small scale. Does not even all school-discipline and every other strict system at home and at business now stand in an entirely new light? It will no longer seem to you now a mere deprivation of liberty, an annoying suppression of personal wishes, but as preliminary practice for all great victories in life? Whoever of you is punctual, be it only in an engagement with comrades, whoever carries out a commission perfectly, whoever perseveres strictly and regularly in his place and in his duty, however many alluring voices call him away, belongs to the invincible army which is today accomplishing marvels of discipline in foreign countries. For, do not forget that great discipline was not created from above by violence, indeed it has been produced not in barracks-yards alone,—if a nation is slovenly in its habits, it cannot be reformed even in a barracks-yard—but thousands upon thousands have been loyal in private, year in and year out, and have done thorough work wherever their duty required and have sought distinction in absolute reliability; but it had to come to light some fine day and manifest itself in the inspiring spectacle that we have witnessed these past weeks.

"And have you noticed how, in these weeks, the example of one has strengthened the other—particularly when everybody noticed that everything was all right with others, when the bank officials saw how the general-staff had made provision, and when the general-staff saw how the banks had the money ready, and so on, to the locomotive engineers and firemen of troop-trains?

" But do not think that it is of no importance when, far from the big world, in the smallest village, someone does his part resolutely and punctually so that one can depend upon him as upon the rising of the evening star, be it only that he delivers promised boots punctually or never assists in the adulteration of food—all these men belong to the glorious army, even if they were never on the battle-field; they also are the ones who win our battles and make Germany irresistible."

"Bravery in daily life" would also be a theme by means of which, in the light of the quite new interest in *heroic virtues,* one might discuss the everyday temptations, tribulations, and conflicts in school and home and, at the same time develop the idea of bravery in all its ramifications—not least of all with respect to the cowardice of white-lies.

The terrible suffering in this war, resulting from bomb-splinters, frost, dampness, and every kind of privation, and the way in which all this is borne, the simple, silent heroism, which always asks only, " What is my duty?"—that is likewise a very fruitful theme for influence on youth, especially pampered youth. " When you think of making a great deal of some unfortunate love-affair, or a decayed tooth, or any other painful or unpleasant thing, think only of the trenches, of the mines, or of the hospitals, or of those whose dearest and most beloved are shot down today as if they were nothing and belonged to no one; then you will be horrified at your assumed importance, and what formerly seemed quite a matter of course to you, the everlasting talk about your own little ego, you will recognize as monstrous and ridiculous effrontery. And that is a life-long benefit, for, those who persist in being puffed up and in clamoring about their own adversities and vexations become out-of-sorts and discontented in life—only he who humbles himself can become big, sound, productive."

Also a word for the children who have lost relatives in the war might be spoken here, perhaps referring to the saying, " The blessing of the father builds houses for the children." But, what blessing can emanate from a father who has fallen on the "field of honor"? an admonition, an assistance so that the children, during their lives, may remain and fight on the " field of honor "—sons and daughters; further, that the father can be kept alive in the children and continue to guide and counsel them, if they henceforth judge all their acts and thoughts from the point of view of his death-sacrifice and remember the " Iron Cross " as a symbol for all brave accomplishments in life.

In the direction here pointed out many proposals will, of course, be made and have already been made. Therefore I

should like to turn to another, just as important, pedagogical view-point, which, in the general and legitimate national exaltation, is easily disregarded; that is the counter-effect to the *dangers* which the war, or let us say, the department of war-news and interest in it occasion for our youth. It is a fact often psychologically observed that the demoralizing effects of the war affect those who directly risk their lives,—who, by all the frightful impressions of death and destruction, are cured quickly enough of an abstract war-enthusiasm—far less than those who merely hear of the successes and heroic deeds and receive no vivid picture of the horror of war. Among those away from the front, and especially among inexperienced youth, there arises only too quickly, from too much interest in war news, a *flippant exultation* over the nameless misery which both friend and enemy pay for the success which is announced in laconic figures by the war-dispatches. A girl in her teens comes from a street-corner where the German naval victory off Chile is posted and says jubilantly to her friends, "Have you read? Magnificent! Fifteen hundred Englishmen drowned off Chile!" I do not consider such things harmless. For the stay-at-homes war can become a school of heartlessness and thoughtlessness if a very earnest counter-effect is not given at the right time. As a teacher, I would, on such an occasion—or even before-hand as a precautionary measure—say with great emphasis, "Listen; whoever is not yet so fortunate in these war times as to be permitted to bind up wounds and nurse the wounded, shall at least *think* of the wounds which war inflicts and of the broken hearts and happiness of the thousands who thereby lose what is dearest to them—therefore, even in our joy over victory, there should always sound a minor note. Do you know what 'minor' means and how it can be expressed? What a loss for us if the others should lose their ships, but you should lose your hearts!"

The challenge has been given to allow youth to *have its own share of war-experience*. That is incomparably more difficult, however, than it looks on the program. For the more the stay-at-homes hear and read of the war the less they *share in experiencing* it and the more false becomes the picture of its real nature, because, for obvious reasons, the press offers little of the *appalling side* of all war-successes. From time to time the shining beacons of a new heroic achievement flash—but in between lies the silent unilluminated heroism of daily endurance under quite inconceivable conditions, and between lies also the equally silent and unilluminated work of the reaper, Death.

To give youth even an idea of the actual reality of the war is to evoke numerous *psychoses*—and again, to delight in the war and its successes *without* making them realize the dark side is really not *having them share in the war,* but is duping our young people into an entirely false picture which may then become the cause of their taking the war very lightly and later acting accordingly.

Therefore I am convinced that war-hours and war-talks in school can be of actual benefit, in the first place, only when they are concerned with essentials and ethical values more than with too direct war-enthusiasm for war and success, and when, in the second place, they are held in a certain subdued tone as one celebrates Christmas in a house where a great misfortune has occurred. Whoever does not understand how to introduce this " minor " into such exercises is no custodian of real German feeling and misses his high pedagogical task of defending German civilisation in the soul of youth against the demoralising effects of war.

At the time of the Spanish-American war, in a street in America, I once came upon a group of boys who were impaling frogs on knitting needles and said in explanation, " We are killing Spaniards." That gave me food for thought for a long while. The monthly notices of the deaths in the various armies by bayonet-attack, mass-attack, by explosives is an absolute danger for our young people—exactly because they are *not* present and do not see the terrible suffering which might awaken their sympathy and create in them horror of war —as happens for all the young people who are at the front today. The teacher can, of course, not prevent all that news from reaching the young people, but he can at least give an *antidote* and it will consist in turning all his energy against the malicious, scornful and brutal talk about " our enemies." Not by mere prohibition and moralising, but perhaps with reference to the following popular saying, " In war either action or silence is seemly—by abuse no battles are won. ' When Israel battled against the enemy, Moses prayed—he did not abuse ! ' Our armies conquer by their *discipline*—if you wish to be spiritually allied with them, preserve discipline in speech, control your unbridled words, do not indulge in hatred and censure. You know that hatred for the enemy diminishes as the ' square of the distance ' and becomes less the longer and nearer both parties stand opposite each other at the front." (Let evidence of this be adduced and have the pupils tell stories of it and have this psychological fact explained.)

In the reports of the schools of Wuertemberg (No. 6.)

Professor Prodinger writes for youth and others, "'Woe to those,' a German clergyman rightly exclaims, who had apportunity to see the horrible battlefields in France, 'woe to those who bear the frightful responsibility before modern and world history for this dreadful war, for the sorrow of the bloodly struggle of nations which no human being and no pen can describe!'

"We shall win, that is without doubt, and we shall become the lords of Europe.

"Yet open Holy Scripture and you will find a sentence that sounds as if it had been written today. 'What would it profit a man if he shall gain the whole world, but suffer harm to his soul?' We are on the very point of gaining the whole world; let us take care that we suffer no harm to our soul! That would happen, however, if we should forget that even in this war brother is fighting against brother, if we allow to arise in our hearts feelings of hate and contempt for the individual who bears arms against our country."

I once heard how a boy fourteen years old, who belonged to a Gymnasium Navy League was asked by a foreigner, of the same age, what was to be done with all the new ships; he gave the answer; "We are going to blow you up!" From such answers can be seen how harmful it is to involve immature, young people in the details of the defense of the country. True war-pedagogy, as far as it has to do with the preparation for war efficiency, will fundamentally disregard such premature dedication to the interests of adults—that promotes only megalomania—rather in work and in sport there should be laid *foundations of character* on which the accomplishment of the German army rests and, above all things, the cultivation of the German soul shall not be harmed by mere playing with the mercilessness of war. For the very fact that we have a *civilization* to defend and are not merely a war-folk is the very thing that gave the present military exaltation of the German people so powerful and moral an *élan* and reserve.

Field-Marshal Hindenburg is said to have given the following answer to an Austrian Gymnasium-class which sent him a letter of homage; "Don't think of me at all now, but only of your lessons; *you* take care of your studies and *I* will take care of the Russians!" In this answer lies more genuine war-pedagogy than in many well-meant, unpedagogical suggestions which are being made today by educational specialists for the "participation of youth in the war." Nothing would be more unbearable than a new youth whose self-assertion would be thundered forth by our new mortars and which would be allowed, in the dearly-bought, powerful position of its people

(for which it has as yet accomplished nothing) to revel with words and feelings in the consciousness, "See, we belong to those people there with the big guns!" *Videant consules!*

A very difficult task is placed upon the teacher by the wish expressed by some authorities that the greater German victories in arms should be celebrated in the schools, too, by addresses. The wish is justifiable and the task full of good pedagogical opportunities—but also full of dangers, or will our philologists not herewith recall all that deep, religious feeling prompted Greek and Roman generals to say against victory celebrations. It was profound dread of pride, of challenging the gods, that made the heathen shrink from any too strong emphasis on personal or national success. Our piety, in contrast to that, has become very superficial, although Christianity has made a great ethico-religious conquest of "ὕβρις." We imagine that victory is a direct reward from God for our superiority and may, on that account, be jubilantly acclaimed without restraint. But may a victory not be permitted by Providence also as a great temptation and test? Does not victory have on men of all kinds a quite remarkable effect, dangerous for the higher faculties? So that mundane triumph might appear to a more penetrating glance to be rather a curse, a divine alienation, and not a divine blessing—even though man accepts it in that spiritual attitude which antiquity prescribed? At any rate, in the ancient aversion to all celebrations of victory, in that pious dread of vindicating and enjoying victory simply as a merited gift of God, there is a far more humble deference toward the inscrutable mystery of divine decree than is expressed in our hackneyed war-metaphysics. That demand for the greatest discretion in joy about one's own good-fortune, that dread of any too express delight in one's own superiority was certainly anything but superstition; behind it stood, rather, the profound presentiment that every worldly success denotes far more probably an affliction than a favor from God and that that hidden curse of triumph may be transformed into a blessing only by extraordinary humility and unobtrusiveness.

There is, morever, also a purely ethical motive which should actuate great discretion in victory celebrations. Behind the dispatches of victory we read always of the "heavy losses" of our enemy, yes, often of "mountains of corpses"; we know how many foreign tears and how much mourning our triumph connotes. Awe of the misfortune involved in our success, the social feeling which links us with the distress of others, and especially in our time is so deeply awakened, all these impulses must not be stifled by victory-jubilation; on the con-

trary, they must suppress it—or the curse of victory is already upon us! For the above reasons it is of great importance for the ethico-religious education of our youth that in official discussions of national success the teacher understand how to repair the honor of that ancient awe of "ὕβρις." That can first be done by a chivalrous word about the defeated and then by dispensing, at all such celebrations, with all national self-praise. Let us be satisfied with the statement of essentials; let us mention exemplary traits in the heroism of war-life; especially and finally, let us not fail to say something about our moral attitude towards success—even success in school—and about the dangers of success, with direct reference, perhaps to the above-mentioned ancient ideas. Let us explain why it may be not only "*vae victis*" but even more rightly "*vae victoribus*" and how the individual and the nation can sustain trials of strength, and preserve modesty and magnanimity without which they are odious to God and man. Thus school youth is kept clear of the intoxication of victory—and that is of great importance for complete moral development.

The third task for the guidance of youth, in the midst of the present world-war, is inner preparation for the *inevitable reconciliation of the nations.* Much that was suggested in the foregoing for the counter-effect to hate belongs also to this folk-uniting task of the present pedagogue. There are today, unfortunately, even university savants who travel around preaching race-hatred—we educators have, of course, the holy duty of not indulging in the passion of the hour, but in preparing our youth for the great future task of human civilization. For this kind of influence, of course, only the older pupils are to be considered. To the younger generation it must be stated that, and why, nations are today admonished to reciprocity and partnership, and what moral conditions of such partnership are to be cultivated in every nation. For this moral adjustment to the joint-responsibility of humanity, it is fitting above all that each nation should not only be conscious of what special mission it has for the other nations, but also what it has already received, itself, in the way of important additions and suggestions from foreign nations. In this sense,—in spite of the unreserved condemnation of the powerful politicians of present-day England—this theme should be discussed today: What does our social civilisation owe *English* civilisation? What have we to learn from the English? And further, what do we owe to *French* civilisation? What more has it yet to give to us and the whole world? Such questions shall not approve of the silly predilection for what is foreign which we enjoy in reference to

the *externals* of our striving for civilization; on the other hand, they shall right now direct the young generation to the fact that hegemony of Germany can be reasonable, enduring, and beneficent, only if this hegemony—with complete preservation of the national principle—becomes a *German leadership to constructive, folk-uniting world-policy* and to paving the way for the "United States of Europe." *The world-policy of national egoism* will, of course, be reduced *ad absurdum* by the world-tribunal of this war—if from it a purification of the whole civilized world and a new order of all national relations, based on deep foundations of civilization, arises, the terrible sacrifice will not have been in vain. If, however, the world should continue to be governed *by the old methods of mutual fraud,* the sacrifice would be in vain and a new world-conflagration would burst forth in which human civilization would be consumed.

The pedagogical tasks mentioned above must, of course, be grasped at the roots. That is, in every proper scope granted to the fighting instincts of youth, especially at the "Indian" age, in connection with the world-war, *practice in establishing and maintaining peace* must become a new theme for the guidance of youth; the paths which are to be found there are far more important than all the paths sought today by youth. Let us tell young people quite frankly that they are responding to the war-spirit falsely if they are doubly ready to fight in home and school, and if they immediately declare war against anyone who attacks their sense of honor and rights. Even in the present war we have surely seen how much it means for a good conscience and the weight of defense when one can say that one has first used every effort to mantain peace. Our emperor gave to the enemy the *advantage in mobilisation* because he wished to assure to Germany the *advantage from love of peace.* From this advantage, however, has developed the greatest momentum of our defense. Therefore, practice in understanding, in the power to imagine one's-self in another's place, in chivalrous advances, in good-will about compensation is just exactly as important for the right *moral* preparation for an unavoidable national struggle for existence, as is practice in military matters. Let us give example of youthful conflicts, even between children of the same family, and let youth occupy its own inventive powers in the discovery of peaceful solutions. Of course, too early and absolute peacefulness in youth is not natural nor educative—in boys' fights much hidden ethics may often lie—but we allow our youth to grow up too much like Indians; we forget too often that *heroic and chivalrous traits of character* can first be practiced rightly in *estab-*

lishment of peace and that this practice becomes more and more indispensable subjectively and objectively for our entire civilization; and as has been said, "Only the sincere peace-maker can in case of extreme peril speak of an 'honorable war.'" I should write on the black-board, "Who is to blame for the world-war?" and have the children guess in vain until I say myself, "Every one who thought only of himself and his rights, everyone who provoked others by arrogant talk, everyone who immediately flew into a passion when he felt his sacred sense of honor injured in any way, everyone who forgot that, in a quarrel, no *one person* alone is entirely right, everyone who expressed or spread, violent, coarse, incorrect ideas about another, everyone who could not stand the success of another—all these unpeaceful people have worked to stir up general hostility in the world; they have summoned the evil powers from whose rage the world conflagration was kindled." It is very important in this sense to show youth its own characteristics in the light of the great tragedy of life: "See *that* is the spirit which keeps war in the world, which throws bombs, destroys cities and drives entire nations against one another in rage and hatred!"

This kind of stimulus belongs especially in the *girls' schools*. Women have not hitherto done their duty in preventing the world-war, and they are not doing it today either. Indeed one hears from women, more than from men, talk filled with hatred, and emotional judgments about foreign countries. All too seldom do women talk for peace when it is a matter of men's fighting; much too often do they contribute inflammatory talk and excited condemnation so that a breach is hastened or other premature decisions are made. How unusual is Iphigenia, who overcomes the racial curse of hatred and of force by sheer humanity! How rare is Antigone, who loyally keeps faith with the mission of women! *"I am not here to share in hatred but in love!"*

Truly to day is the hour when all mankind must think of "Blessed are the peace-makers" and must call a halt to this recklessness of hatred and provocation; and now is the time for our young women, in view of the frightful events in the world, to burn into their hearts once more with sacred fire the Christian mission of woman: that she may assume her peaceful mission with more consideration, not in programs and ideas, but in habits of judgment in everyday life, that she may think more of the *sacredness and responsibility of speech* and use all the conflicts of life to exercise the strength and effect of the peaceful, uniting, reconciling voice of woman. That is the most sublime *"franchise of woman."* Women think today

that their mission is accomplished if they bind up the wounds that men have inflicted—but their highest mission lies in preventing the infliction of wounds and of making a sacred science and a sacred art of maintenance and establishment of peace in all circumstances.

If the generation of teachers who have remained at home should no longer feel that they must do everything to educate youth in the above sense for the *reconciliation of nations* and, in this sense, also, to discuss the present war, then the generation which is returning from the frightful tragedy of war-events, which is debarred by shattering impressions from all traditional ideas, will take hold of the task with most profound seriousness. May God direct !

THE ABILITY OF THE SPECIAL CLASS CHILDREN IN THE 'THREE R'S'

By Maud A. Merrill, Research Assistant, Minnesota School for Feeble-Minded

Since universal compulsory education has placed in the public schools, children of widely varying abilities, within the last twenty-five years the schools have made special efforts to replace the old procrustean efforts to adjust the child to the school with the more humane modern methods. We estimate that, according to the law of averages, the public school system fits about half the children. The statistics quoted by Stern from Bobertag's experiments with German school children bear out this estimate. Of the other half, one quarter could be advanced more rapidly and the other quarter must progress at a slower rate.[1] Assuming that practically half the children make a grade a year, first graders being six to seven years of age, second graders seven to eight and so on, we might define the task of the special class as an attempt to find out how the other half learns. The task of trying to determine how rapidly the superior child can and should be advanced is one that comparatively few schools are undertaking and the superior child may frequently prove the troublesome child because he hasn't enough to do to keep him busy and out of mischief wherefor, also, he acquires lazy mental habits which are bound to persist after the formative years of his school life.

The special or ungraded class in the public schools usually includes at least two types of children, the temporarily backward and the feeble-minded. Its objects are two: to relieve the regular grades and to educate or train the atypical child. What we expect of the special class child in the way of education depends upon what we expect of him in the matter of his future adjustment to society. The Cleveland public schools divide special class children into two groups according to their social competency or incompetency. The socially competent are those who will probably be able to earn a living without supervision and under this group are classified the blind, deaf and crippled children. The socially incompetent are those who will probably always require more or less supervision. Under this second classification are the children in the ungraded or

[1] Stern: "Psychological Methods of Testing Intelligence."

so-called " subnormal " classes, usually the only special classes in the school. These children may be educable but to what extent? They are all trainable, but to what extent? And if they are both educable and trainable to what extent shall we emphasize the one at the expense of the other? If they are educable how much of the fundamental "reading, 'riting and 'rithmetic " that their limited capacity permits them to acquire, is going to prove socially useful to them? How useful will training, and by training I mean industrial training, be to them in their attempts to meet the requirements of society or to contribute to their maintenance under supervision?

The answers to these questions constitute the immediate problem of the special class. To determine in how far these special class children are capable of education, we rely primarily upon our mental tests. To determine in how far they are acquiring the three " r's," we have been applying the now fairly standardized educational measurements or pedagogical tests.

The group of children whose three " r's " ability this report covers, consists of children from the regular grades, who have been examined mentally and pedagogically for the special classes of several school systems in Minnesota and also children in the school department of the Minnesota School for Feeble-Minded who constitute a similar group. The institution children average more years of special training than the special class children. The range of ability represented in the group examined varies from mental age five to mental age eleven and a fraction, covering grades from kindergarten to fifth grade. (And it is literally *to* fifth grade as no child is able to do fifth grade work in all of the three " r's.")

Prof. Mitchell cites in his Cleveland School Survey [2] glaring examples of poor economy in the herculean tasks set the special classes in the attempt to teach certain children. The story of the boy who spent seven years in the special class after having attended the regular grades for three years, with the result that he is able to write laboriously such simple words as " my," " see " and " dog " but is unable to read the words after having written them, is followed with the terse comment, " The city has paid about $1,000 for his education."

The pedagogical measurements used are all individual tests adapted from the Starch tests in Reading and Spelling, the Courtis Arithmetic tests and the Ayres and Thorndike Writing tests. They have been given in connection with the child's mental examination and have been selected with reference to the child's mental age in each instance.

[2] Mitchell: " Schools and Classes for Exceptional Children."

The reading tests are all measurements of oral reading. The child's mental age was taken as the index of his intelligence and the reading test results express the measure of the mechanical aspects of reading; account was accordingly taken of mispronunciations which indicated unfamiliarity with the word, or errors of substitution and omission, of hesitations and of the rate of reading. For instance the mental eight year old was given the second grade reading passage and his failure or success with that passage indicated whether he should be tried in a higher or lower grade passage, several passages being tried in this way, until his reading ability was determined. The spelling tests consist of lists of words of known difficulty and the score is expressed in terms of a percentage of the total list of 100 words. The standard first grade score is 10%, the second grade score 30% of the list, etc. In the writing tests only quality was measured. The writing specimens were compared with the samples in the Ayres and Thorndike scales and were graded three different times by each scale, the score being the average. It is probable if the writing speed had been taken into consideration the scores would have been markedly lower in many instances. The arithmetic tests are the standard Courtis tests. Series "A" was given to test a degree of ability below that required to handle the more complex processes of carrying and adding longer columns. Besides these simple number combinations, series "B" was given in which the more complex functions were required. Arithmetical functions involving reasoning were not even attempted.

Table I shows the average grade attainment of each mental age from the mental sevens, who should attain first grade to the mental tens who should attain fourth grade. The number of cases beyond mental age ten was so few that I have not shown them.

I.

AVERAGE GRADE

Mental Age	VII	VIII	IX	X
Av. Chr. Age	15.8	14	14.7	16
Reading	.9	1.3	2.3	2.8
Spelling	1.	1.5	2.7	3.3
Writing	1.7	2.3	3.3	3.3

DISC. OF TABLE. The Roman numerals at the top show the mental ages of the group tested. The average chronological age for each mental age group is given and the average grade attained by each mental age in spelling, reading and writing.

Ex. The mental eight year olds attain 1.3 grades in reading.

It is significant that in each instance the mental tens fall

farther below the expected grades than do the children of any other mental age. In reading, where they should attain fourth grade they do not attain even third, in writing, in which the other mental ages excel, they attain only a fraction more than third grade. The tests in arithmetic have not been standardized below the third grade and the performances of the special class children in arithmetic are so poor that I have not attempted to show the average grade attained.

The Arithmetic table,—II—however, shows how far short the mental nine and ten year olds, fall in the fundamental operations in arithmetic. In the first series involving only simple number combinations the mental nine year olds attain only 55% of the standard score in addition, and this is the highest attainment. In the second series where the addition of longer columns and carrying are required, the result is even poorer.

II
ARITHMETIC

	Series A				Series B			
% Stand. Score	Add.	Sub.	Mult.	Div.	Add.	Sub.	Mult.	Div.
M. A. IX....	55	31	32	13	33	17		
M. A. X....	40	35	23	12	30	42	33	25

Even where the feeble-minded child seems to be able to perform arithmetical operations in a mechanical sort of way, he frequently fails to grasp the abstract idea of the process so as to be able to apply it. Supt. Johnstone of Vineland, New Jersey tells a story which illustrates admirably the inability of the feeble-minded child to use ideas of subtracting other than in the concrete instance to which he is accustomed. John was asked, " Suppose you took six ears of corn to your horses "—but John said, " We don't take them six ears of corn "—" But just supposing you took them six ears "—John said, " We don't take them six ears." In other words he had not used this number in that connection. He was then asked " Suppose you took them twelve ears of corn, and only fed them ten, how many would you take back?" He said, " Two." " How much are twelve less ten?" John said, " Oh, I don't know that many." " Suppose you took twelve loaves of bread to Mrs. A. and she only wanted ten, how many would you take back to the store-room?" " I don't go to the store-room." " But supposing you took her twelve loaves and she only wanted ten, how many would you have left?" John thought and thought and finally said, " Three."

In reading, the results show an increasing inability to maintain the standard that the grade of intelligence would lead one to expect. The table at the left of the reading chart—III—shows according to intelligence quotient the number of children who read at the proper grade for their mental age and those who are advanced and retarded. The intelligence quotient, the ratio of the age to the mental age, expresses mental development in terms of the per cent. of normal development. An I. Q. below 50% places the child in the imbecile grade, from 50 to 75 constitutes the moron grade, from 75 to 89 children are classified as backward.

III
READING

I. Q.	At Grade	Adv.	Ret.	Total	M. A.	VII		VIII		IX		X	
					Grade	No.	%	No.	%	No.	%	No.	%
40-50...	3	2	3	8									
50-60...	17	6	14	37									
60-70...	22	13	44	79	I	13	40	19	54	5	54	2	70
70-75...	12	2	11	25	I	18	50	11		8			
75-80...	8	1	7	16	II	3	10	18	33	10		6	
80-86...	3	1	8	12	III	2		5	13	13	30	4	
					IV	1		1		7		3	18
Total.	65	25	87	177	V			1		1	16	2	12
Per cent	37	14	49		Total..	37		55		44		17	

In this table I have shown the distribution of ability from 40 to 50, from 50 to 60, from 60 to 70, from 70 to 75, from 75 to 80 and from 80 to 86 which covers the variation in abilities of the special class cases. Only 37% of the children read *up to grade,* while 49% of them *are retarded,* and only 14% *advanced.* That is, in 37% of the cases the mental age of the child corresponded to the normal age for his reading grade. In 47% of the cases, the reading grade attained was higher than the expected grade for the mental age, and in 49% of the cases the mental age was higher than the normal age for the reading grade.

The table at the right shows the number of cases at each mental age who do first grade work, less than first grade work, second grade, etc. The reading score shows a steady decrease in the percentages of children able to do the reading of their proper grade. Fifty per cent. of the mental seven year olds do first grade reading, 30% of the mental nine year olds do third grade reading and only 18% of the mental ten year olds are up to standard in fourth grade reading.

The spelling results are somewhat better. The process is more mechanical than reading. The spelling scores (Table IV) show, however, 33% of the children in their proper grade, 22% advanced and 45% retarded.

IV
SPELLING

I. Q.	At Grade	Adv.	Ret.	Total
40-50...	4	2	3	9
50-60...	16	9	10	35
60-70...	22	20	36	78
70-75...	6	3	12	21
75-80...	4	3	9	16
80-86...	4	1	6	11
Total.	**56**	**38**	**76**	**170**
Per cent	33	22	45	

M. A.	VII		VIII		IX		X	
Grade	No.	%	No.	%	No.	%	No.	%
I	12	31	9	49	2	47		
I	18	46	16		5			
II	6		16	31	13		5	
III	3	23	10	20	11	25	5	60
IV					9		3	17
V					2	28	4	23
VI					1			
Total..	39		51		**43**		**17**	

Here, too, we note a decrease in the percentages passing at the higher mental ages; 46% of the seven year olds do first grade work; 31% of the eight year olds do second grade work; 25% of the nine year olds do third grade work; and 17% of the ten year olds do fourth grade work.

The feeble-minded child has little or no idea of the logic of spelling, of any connection between sound and letter. One small boy of my acquaintance spelled with amazing agility any word that I gave him, regardless of any possible connection between sound and sense. When asked to spell corn he inquired whether I wanted him to spell one ear of corn or a whole field full. Upon being assured that I would be satisfied with one ear he carefully spelled "r-h-n." But when asked to spell a whole field of corn he said "c-m-i-h-l."

With writing the case is quite different. Here the process is a mechanical one to a great extent and the experience gained in his longer training shows in the quality of work done by the feeble-minded child.

V
WRITING

I. Q.	At Grade	Adv.	Ret.	Total
40-50...	5	2	2	9
50-60...	9	17	9	35
60-70...	23	31	26	80
70-75...	6	9	5	20
75-80...	6	4	7	17
80-86...	5	1	6	12
Total.	**54**	**64**	**55**	**173**
Per cent	31	37	32	

M. A.	VII		VIII		IX		X	
Grade	No.	%	No.	%	No.	%	No.	%
I	8	21	8	22	1	27	1	44
I	13	34	13		6		2	
II	7		12	38	5		3	
III	3		8		14	32	1	
IV	6	45	6		6		5	31
V	0		5	40	7	41	3	25
VI	1		2		5		1	
VII			1					
Total..	**38**		**55**		**44**		**16**	

So in this Table V we find the largest percentage of children advanced 37%. Only 32% of the children are retarded and 31% at grade. When we consider the number of mental seven year olds who make first grade we find 34% at grade while 45% are above first grade. Of the mental eight year olds 38% make second grade and 40% are advanced; 32% of the mental nine year olds make third grade and 41% are advanced. But of the mental ten year olds 31% only are up to fourth grade standard while 44% are retarded and only 25% advanced.

In this study of the three 'r's' ability of special class children, it is probable that more extended investigations will show some variation in the results.This is but a preliminary survey. It is probable that the reading tests may show some deviation when the oral method is more carefully standardized and, in comparison with Starch's silent reading tests, may grade a little higher. The rate of silent reading with which the present comparisons have been made will probably prove to be a little too high even in the lower grades with which these comparisons have been made. So, too, in the writing some details of procedure remain to be worked out, which may reduce the general writing average. Undoubtedly, on the whole, the tendency of special class children to fall below the expected grade for their mental age, is very marked.

VI.
AVERAGE ABILITY

ARITHMETIC	30%
READING	75%
SPELLING	87%
WRITING	119%

These children then, have an average chronological age of fifteen years. In arithmetic they attain only 30% of what they are expected to attain at their mental age. In reading,—in which they attain average grades of .9, 1.3, 2.3 and 2.8 when the average grade attained should be 1, 2, 3 and 4,—this ability expressed in terms of a per cent. of the average ability, is only 75. That is, in reading, the special class children do only 75% of what they are expected to do for their mental age. So in spelling where they attain average grades of 1.0, 1.5, 2.7 and 3.3 instead of 1, 2, 3 and 4, they measure up to 87% of what they are expected to do for their mental age. And in writing where they exceed the expected grade 1.7, 2.3 and 3.3 with the exception of the mental ten year olds who fall short of fourth grade work in writing attaining only 3.3 grades, the ability is 19% above the expected score for the mental age.

School performance depends, of course, "not only upon

intelligence but upon other and quite different factors." And it is these " other factors " in which the feeble-minded are conspicuously lacking. These factors belong to the domain of will and consist, according to Stern's analysis, of " degree and duration of attention, industry and conscientiousness, sense of duty and capacity to fit into the social group."

In striking contrast with the poor results obtained with the educational work, see what these same children are able to do with their hands! We have seen that they are only to a very limited extent educable. They are trainable and to what further extent.

We will take only one mental age and note briefly the various kinds of work which children with a mental age of seven years can be trained to do satisfactorily. On the school records these children are graded according to the quality of the work done as " Poor," " Fair," " Good " and " Very good."

Without going further into detail, we can see that the range of occupations, which can be satisfactorily carried on by the feeble-minded *under supervision* is comparatively wide when we consider their limitations in the common school branches. This correlation between mental age and skill in manual work has been worked out with minute care for each mental age.

VII

MENTAL AGE VII Girls

Work		Poor	Fair	Good	V. Good
Arts and Crafts:	Reed and Raffia		1	1	
House work:	Sweeping Setting table Washing dishes Scrubbing Bed making	6	11	19	2
Sewing:	Hand sewing Carpet rags Basting Machine sewing Mending	1	5	16	
Lace making:			1	5	
Weaving:	Rugs Linen	1	2	2	3
Knitting and Crocheting			2	1	
Laundry:	Sorting Ironing starched clothes Mangling Ironing unstarched clothes	1	6	19	2
Tailor shop:	Button hole machine Coats and blouses			1	1
Total per cent		8	25	60	7
Total number of cases		9	28	64	8

VIII
MENTAL AGE VII Boys

Work		Poor	Fair	Good	V. Good
House work:	Scrubbing, Polishing, Sweeping, Bed making		2	1	1
Laundry:	Washing, Sorting clothes	1	1	3	
Kitchen:	Cook's assist.		1	1	1
Scullery:	Washing utensils			2	
Outside	Teaming, Lawn work, Pick and shovel		3	1	2
Shoe shop:	Repairs		1		
Bakery:	Bread cutting			1	
Steward's helper				1	
Brush making:		2	3	8	5
Rope Braiding:				1	2
Bench work:			2		
Caning:			1		
Net:	Beginning 2, Bag 2 } 5; Fly net 1; Hammock 2; Tennis net 2 } 8		1	2, 6 } 10	
Total number cases		8	15	29	19
Total per cent		11	21	41	27

Although this is but a preliminary report of a much more extended investigation of the three " r's " ability of the feeble-minded, and there remain to be worked out details of procedure in evaluating scores, a carefully standardized series of individual reading tests, and a less subjective method of scoring for writing tests, yet this much is evident from the present data.

The object of the special class work of which we must never lose sight, is to adapt the education and training to the capacity of the individual with a view to his greatest usefulness to himself, and to society. If we can teach the child to read for his own enjoyment, well and good. If we can teach the child to read so that he will be more efficient as a member of his community, well and good. But if we are going to spend time and energy teaching him to read so that he can make better brushes, which a child with a mental age of four can do, we might better save our energies for teaching him how to do better net work. In teaching these subnormal children the three "r's," as Miss Farrell says, "We are asking them to use the finest coordinations and those most recently acquired in the history of man . . . They have to use the large crude movements. They have to do things primitive man did and do them in a primitive way. We cannot ask of them the finer coordinations of more highly developed people."

THE VOCAL TREATMENT OF STUTTERING*

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The object of this paper is to offer some practical suggestions as to the treatment of stutterers, especially class treatment as worked out in certain public schools. In a paper of such limited length, it is impossible to even mention any other phase of the subject. It must be assumed that the reader has some knowledge of the physical, psychic and social significance of this disease.

Generally speaking, the value of vocal training is questionable unless its relation to the mental and emotional conditions in the patient's life is made clear. Any system, demanding a persistent vocal training might succeed in some cases; but it is only when the other elements of treatment are considered also, namely, a re-adjustment of physical conditions, and an analysis of the mental and emotional attitude of the patient, that a permanent cure may be expected.

To be sure, occasionally, a case of stuttering may be found in which re-adjustment is seemingly impossible. Nevertheless, the instructor who has a scientific knowledge of the case is better equipped to handle it. Neither mental treatment nor vocal training alone is desirable; a happy medium would be a reasonable combination of the two. But if a choice were necessary, it would be that of persistent, intelligent vocal training.

Assuming then that in every possible way, physical and hygienic conditions have been improved, and an attempt made to help the patient to self-understanding, the following work in vocal training is suggested. It is based on Dr. Smiley Blanton's outline for treatment. Certain exercises are given in detail. but are merely suggestive of the many others that ingenuity might conceive. Some of them have been suggested by a study of the different methods used by certain specialists; many have been worked out through actual practice with classes of stutterers.

* The scheme of vocal training presented in this paper follows to some extent but only in a general way, the system of training advocated by Dr. Smiley Blanton of the University of Wisconsin, with whom the writer studied for a time. Some of the exercises are original, some were taken from Dr. Scripture's books on stuttering.

Treatment of Stuttering

I. Physical — Hygiene

An important element in treatment. If necessary, the physical condition must be improved in regard to nourishment, sleeping habits, exercise, sex habits, fresh air, etc.

II. Vocal Reeducation.

1. Breathing (to develop poise and remove the symptom of spasmodic contraction of the diaphragm).
2. Tone
3. Inflection
4. Pitch
5. Phrasing

} to overcome constriction of vocal cords.

6. Articulation
7. Relaxation
8. Rhythm

III. Mental and emotional Readjustment.

A careful study of the emotional forces of the patient's life may show fundamental reasons for his affliction.

The value of all these exercises is partially suggestive. A confident, cheerful, encouraging, definite attitude must be maintained. Certain embellishments to these exercises may be valuable in as much as they are purely suggestive. Encourage spontaneity on the part of the pupil.

Suggestions for Treating a Class of Stutterers

Before beginning any class work, give each pupil some individual attention, finding out something of his history, and the type of child you are to work with. Greater details may be gained later. Then organize the class with respect to age, grade and similar conditions.

Arbitrary rules governing class periods cannot be made. It has been found generally more successful to have periods 30 minutes daily. If possible, the instructor should have a half hour preceding each class, during which time, she might give individual attention to certain pupils two or three times a week, as the case might be. This time could be used in obtaining histories, giving certain suggestions which could not well be given in class, and so forth.

To older pupils especially, a brief explanation should be made regarding the kind of habit of speech they are to acquire, more expressive, slower, quiet, and of better pitch.

By suggesting some of the exercises to be used—the use of

rhymes, pictures, certain games, and so forth after a few days have been spent upon breathing and relaxation exercises—interest, attention, and a desire to do well all that may be required will be aroused.

Taking into consideration the age and type of stutterers in the class, explain simply some of the reasons why they stutter, calling attention to the symptoms—poor breathing, indistinct articulation, monotone, lack of expression and poise, tenseness—rather than to the fundamental causes. This must be done encouragingly, impressing the pupil with the fact that while you can help him, he can help himself more by carefully, and persistently practicing all the exercises. Ask them to think of their own voices and notice what is lacking.

Almost without exception, the children respond to this attitude with anticipation and confidence.

A few other suggestions might well be made: First, have the pupil restrain his speech as much as possible for the first few weeks. To demand absolute silence from one not removed from his usual environment is useless. However, some restraint may encourage the habit of reflection and courtesy to others when they are talking—this is often found lacking in stutterers, though perhaps not intentionally.

In a class where so much freedom is desired, it is very important that the teacher be firm, though pleasant, in all necessary demands.

Also important is the plan to impress the class with one definite aim each day—though the teacher may have in mind several objects.

The exercises as outlined in each lesson need not be followed in routine fashion. The repetition of any exercise must depend on the discretion of the teacher. Difficult exercises must be taken up very deliberately in order that the pupil may not be discouraged.

LESSONS

(Reference should be made to exercises given on breathing, inflection, tone and rhythm; also to Scripture)

1. Object to obtain right attitude of the class—interest and attention.—Also to make them understand the type of breathing necessary, and the reason for relaxation.

   1. Relaxation: make this as cheerful as possible; devise games such as "The Ragman," and "Go to Sleep." Continue for several minutes. Have each part of the body relax.

2. Breathing: "Notice how I breathe." Have pupil take correct position, one hand upon chest the other at lower end of breast bone. Refer to Exercises. If necessary, use a couch. Do not begin specific exercises until pupil understands the type of breathing desired. Suggestions might be made regarding the feeling of quietness accompanying this sort of breathing.
3. Alternate Breathing and Relaxation.

2. To begin control of breathing by certain exercises and to test power of the class to relax.

If a general idea of the kind of breathing necessary has been obtained, begin work on exercises.

1. Use every conceivable method to arouse and stimulate interest; observance of others in the class, having the most successful one demonstrate, etc.

   Ex. 2, inhale slowly 4 seconds, hold 2 seconds, exhale 4 seconds, rest. Did pupil feel the gradual extension and relaxation? Number of repetitions of any exercise would depend on the success of the class, and their interest.
2. Exercise 3: inhale quickly, hold 3 seconds, exhale quickly. Notice the quick action of the diaphragm.
3. The two blowing exercises, first rapidly then slowly, may now be taken. Assume the attitude of blowing away feathers.
4. Blow out slowly, during five seconds; later increase to 10 seconds.

   If the pupils are encouraged to make remarks regarding their attempts, it will prove more interesting. These exercises may be varied by accompanying them by arm movements, etc.
5. Relaxation.
6. "How many of you want to try the breathing exercises alone? (factor of competition useful)
7. Whispering. Repeat the first exercise, breathing in slowly, then whispering ah. Make it soft and clear; no tenseness or constriction. Then give the exercise 3, 4, or 5 whispered ah's on one breath. Notice movement of diaphragm.

3. Object: change of Pitch introduced, rising inflection. Definite response expected from the child.

1. Relaxation.
2. Review some of breathing exercises. Call attention to erect position, etc.

3. "Now we are going up a hill—make our voice go up too. Deep breath, hold, give ah with rising inflection. Several sounds may be given, awe, oo, ah, a, ee. Pupils may take turns, giving any one sound. This may be done in order, or the teacher may indicate the pupil who is to respond. (This is the first step in giving the pupil confidence in replying, the responsibility of choosing an answer rests with the pupil.) He must not be discouraged if he fails to gain a great range. This will come only with practice.
4. "Let's try the same with counting." Breathe slowly, hold, count 1, upward inflection. Repeat to 10.
5. Relaxation—make a game of this, but be firm in expecting results.
6. Repeat a few vowels slowly with rising inflection. Then count to 10, also backward to 1. Emphasize correct breathing, etc. Encourage practice of deep, quiet breathing before attempting to answer. Alternate exercises.

4. Object: to gain downward inflection.
   1. Repeat lesson 3, working for downward inflection. Use any of the exercises given, so far. For clearness and interest use any figure of speech which will convey the idea to the child.
   2. Often let the class choose the exercise to be worked on.

      ee r
      Count from e t r u
      n w h o
      1 to 10 o o t f Vary inflection.
   3. Count to 10 upward inflection, back to 1 downward inflection.

5. Object: to give confidence in the power of the voice to rise and fall. To give vowels more clearly.
   1. Review some exercises in breathing; upward and downward inflection and counting.
   2. Relaxation.
   3. Explain the desirability of improving vowels, in order to be more easily understood, and to make the words firmer. Note any mistakes such as lips closed too tightly, muffled sounds and so forth. Write back vowels on board. Encourage individual efforts. (a) Give slowly on one breath. (b) Glide from one to another. (c) Give several vowels on one breath. Avoid any tendency to give them in a monotone.

6. Object: Review principles of breathing, inflection, etc. Confidence in naming objects.

1. Recall some of previous lessons. "Do you remember how we counted to 10? Can you give these vowels as we did?"
2. Write all vowels on the board. Try both upward and downward inflection.
3. Relaxation.
4. Now, when I point to objects I want you to name it as tho' you were giving a vowel. (Have pupils listen to change in voices, and avoid constant repetition of same inflection. Point to all objects in the room, parts of the body, and persons.)
5. Have another pupil point out things. The same may be done in regard to colors.
6. Alternate other exercises.

7. Object: tone production. Inflection.

1. Review vowels, repeating after teacher. Name some objects.
2. Breathing Exercises.
3. Relaxation.
4. Explain change of inflection in counting. Indicate by use of dashes. Try downward inflection. Vary exercise by using both inflections with numbers, 1-5. Encourage pupil in giving any of his own. If good, have them repeated by the class.
5. Do the same with vowels, first using one vowel; then changing the vowel each time.
6. Now give "Jack and Jill," indicating inflection by dashes; drawing pictures, etc, will stimulate interest. Have the pupils recite together and individually.

8. Object: breathing; inflection, phrasing, rhythm.

1. Emphasize these points perhaps not in the exact terms in "Jack and Jill." Repeat several times. (Let some child draw pictures.)
2. Relaxation.
3. Counting 1-10.
4. Name objects pointed to.
5. Breathing, slowly, counting to 10 while exhaling.
6. Alternate any of these exercises.

From these few sample lessons, one may gain an idea of

how necessary it is to work deliberately, carefully and interestingly over each step of the course. It will be seen that almost every lesson dwells on several points in our plan of vocal training. It will be found well to call the attention of the class to one or two definite points in each lesson. "Now, we are going to work on phrasing," or "Today I am going to see how many of you can remember to breathe correctly especially when you answer me," or "This is the day we are to make every vowel we use just as clear and pure as possible."

About this time, if certain pupils have complained that it was hard to give a certain consonant, I would show them how to make it, just what the muscles had to do: take P, for instance. "Just open the lips quickly when you are ready to say it." I might if necessary try Dr. Ash's plan of classifying sounds.

So, far, the outline shows how various exercises may be introduced in grade of their difficulty. But every lesson is used to carry out the general demands of vocal training, and each should contain a few exercises on some of these fundamental steps in vocal reeducation.

Just a suggestion of the various exercises adaptable for class use:

1. Vowel Drills
   (a) Given alone, (b) given in combinations gliding from one to the other; (c) lists of words containing a specified vowel may be volunteered by class.
2. Consonant Drill.
   Similar drills as those for vowels, perhaps some explanation as to their formation.
3. Drill on words:
   (a) Name classified lists as birds, animals, plants, trees, flowers, books, articles of furniture, of food, etc.
   (b) Name things which are tall, short, heavy, pretty, good to eat, good to play with, etc.
   (c) Give association words as an exercise for prompt response.
4. Questions and Answers; (by either pupil or teacher)
   (a) Who? How? When? Where? Why? Did? Can? How many? In what direction? How long?
5. Descriptions:
   (a) Simple articles. (b) rooms; (c) persons; (d) designs, symbols, etc. (e) pictures.
6. Numbers.
   (a) Read numbers; (b) make out grocery bills, etc.

7. Comparison.
   (a) of articles, (b) of people; (c) of buildings, etc.
8. Directions; have pupil give them.
   (a) to go somewhere; (b) to do something, etc.
9. Reading.
   (a) In unison; (b) alone; (c) reproduce stories; (d) original stories.
10. Miscellaneous.
   (a) Any conversational game; (b) dialogues; (c) riddles; (d) short stories; (e) short autobiographies; (f) relation of events; (g) travel talks; etc.

AN EXPERIMENT IN THE TEACHING OF ELECTRIC WIRING

By Robert Van Allen, Murray Hill Vocational School, New York

Enough has been written on what ought to be done in education. More important at this time are (1) what to teach, (2) how to teach, and (3) when to teach it. Assuming what to teach. the writer has attempted a partial answer to the second problem—how to teach it. Educators have too long been satisfied with basing their work on what has been done and on theoretical speculations of what ought to be done. The aim of this article is to give briefly an account of some preliminary work done in an attempt to discover what can be done in the presentation of the problems involved in electric wiring from the standpoint of economy and technique of learning.

Concentration of industry, the use of large capital, the employment of machine tools, and the organization of modern industry resulting in present competitive methods brought about the rapid decline of the apprenticeship system. The efficiency of this system depends upon the personal relation between the teacher and the taught. In modern times the relations between employer and employe are mostly determined by technical considerations. Sharp competition in business has left little time or desire on the part of employer to instruct apprentices. The learner has, therefore, been compelled to shift for himself and to "pick up" his trade as best he may. The employer, moreover, has come to feel that in training apprentices he may be doing so for the benefit of rival firms. He therefore considers it more advantageous to offer sufficient inducement to obtain the journeyman trained by others. The high degree of specialization, or division of labor, in the industries also works against the training of apprentices on the part of employers. An apprentice could, of course, after the completion of one specialty take up others. But this he is not likely to do, because the change would mean a decrease in wage. The industries in consequence are suffering from a great dearth of skilled labor. Comparatively few workmen can make or understand a working drawing and still fewer possess the ability to express their ideas on paper by means of suitable sketches.

The solution of the apprenticeship problem is the establishment of vocational schools. In the nature of the case, no school can take the place of the actual shop; but what can be done is to make the school as close an approximation to it as possible. The graduate can not be made a trained mechanic, but he can be made an individual trained to become a mechanic of more than ordinary ability.

In the teaching of electric writing and installation, schools in the past have attempted to give their students a knowledge of the subject by having them lay out the work of the trade in a schematic form on panel boards. Some feeble attempts have been made along the line of using miniature houses. The writer has attempted to bring the real work of the trade to his pupils by the actual construction of a building differing not in kind but only in size to that on which his students will work when they leave school. A brief description will make clearer the work being done.

The pupils procured studding, laths, and other material from a building that was being wrecked. With this material a two-story seven-room house was constructed in one of the shops. The rooms average four by five feet by six feet high. Every problem that confronts the mechanic in installing electric wires in a building is given the pupil in this practice house. According to the layout given him, he installs cables and the various types of electric light wiring for finished and unfinished buildings. These include knob and tube work, cleat work, metal molding, condulet, BX cable, Greenfield tubing, and exposed and concealed loricated conduit work. Panel boards, ceiling outlets in decorative designs, and switch and base receptable outlets are inserted in unfinished rooms and also in finished rooms, necessitating practice in carefully taking up flooring, removing base-boards, and cutting into plastered walls. That his course may be complete, the student is required to install, in addition to bells, push-buttons, annunicators, and door opener, the many devices and instruments employed in fire, burglar alarm, and telephone systems.

It is the purpose of the writer to take two groups of students as nearly equal in all respects as it is possible to get them; and to have one group use the old panel board method of learning, while the other group works out the same problems by means of actual work on the constructed house. The writer will control conditions so as to be able to measure quantitatively the merits of the two methods of teaching from the standpoint of economy of time and energy and thus be in a position to make a contribution of scientific validity to education.

BOOK REVIEWS

Johann Gottfried Herder as an Educator. By J. Mace Andress. New York, G. E. Stechert & Co., 1916. 316 p.

This book gives an interesting account of the life of Herder, the German educator of the last half of the eighteenth century, a transition time in which the foundations of the Germany of to-day were beginning to be laid. Early in the period we see the lack of national unity, the deplorable social conditions, the medieval notions of acceptance and obedience being reflected in education and in other phases of national life. In the midst of the passing to better things lived Herder, the spokesman of his time.

Dr. Andress has marked the steps of this progress: Rationalism,—the *Aufklärung,*—the growing liberty of thought and freedom of expression, but with a too unlimited confidence in reason as such; the Realism of Comenius and Locke with the impetus given by Rousseau, reaching Herder and his contemporaries, Basedow and Pestalozzi, marking the passing from the theological to the secular and to the study of science and philosophy in the universities.

All this led to the New Humanism, for which Herder stood, and which infused a still more liberal spirit into life, emancipating it from deep-seated prejudice and the worship of tradition; thus there resulted a more democratic educational ideal, the emphasis being shifted from form to content; it now appeared to be the privilege and the duty of every man to fully realize the possibilities of his nature. Then came the fruit of this flowering, the spirit of Romanticism, in which was manifested man's wealth of divine emotions, and which led the way to the study of Nature and to an era of Art, Music and Poetry. Thus Herder's life was set in the midst of many interests which had had their day and the rise of others which were to have a shaping influence in the national life.

As the writer has shown us, only recently have we realized that theories and practices of education are but superficially understood unless seen in the light of universal history; this perspective brings men who have seemingly had little influence upon education into new prominence. Thus it was with Herder, whom most texts on the History of Education fail to mention; his name suggests rather the preacher and the man of letters; besides he has given us no coherent and systematic work on Pedagogy, like Rousseau's "Emile"; what he wrote on education seemed to be the overflow from his other lines of thinking; just as a poet may give scientific, political or social problems a literary value, so Herder in all his writings assumed the attitude of the educator.

The book gives us a graphic picture of Herder's life: the son of a school-master, under the dogmatic pedagogue, Grimm, tyrant and pedant, standing for all that Herder hated in a teacher, at the same time being a favorite of the man who awakened in him a passion for reading and a desire to learn. Later he became the copyist of a curate, morbid and pious; but he, too, stimulated Herder to further study and thought. Then he entered the University of Königsberg for theological training, where he was made inspector in a boy's school. Here he first met Kant, who was then a lecturer in the University, whom he later regarded with the

greatest gratitude and respect; he was especially impressed with Kant's idea that man as a natural being was dependent on his natural surroundings, and that in these he must reach his highest development. Thus early in life and with some sense of satisfaction he found himself a teacher with a born passion for imparting knowledge. In Riga, his next field of work, he found an atmosphere commercial rather than scholarly; but to his delight its spirit was opposed to the conventional education of the day.

His Wanderjahre of two years took him to Nantes, Paris, Hamburg, Strassburg,—a kind of Faust, he says of himself, wandering about in search of experience, having become weary of books. During this time he met Goethe, later his intimate friend, who said of him, "Herder is the sworn foe of all sham and ostentation." He proved to be one of the great inspirations of Goethe's life and work. In Weimar, where he later became Superintendent of Schools, was written his most important book, "Ideas on the Philosophy of History," which treats of the evolution of man, and the methods of the scientist before such study was vital in education. He died in Weimar in 1803.

In the ordinary use of the word Herder would not perhaps be regarded as an educator; he had no direct influence on methods of teaching, and his general theories on the subject are to be found largely in writings which suggest little relation to Pedagogy. But Dr. Andress makes the reader feel that this term in its broadest sense applies to Herder. He was identified with all the forward movements of his day; he was among the first to recognize that education is conditioned by the other great forces of civilization; and, while his ideas were not revolutionary, he led the way to the goal where everything was pointing. He stood for principles in education which are fundamental; he was a pioneer in the genetic method of study; he even realized the fatal propensity among educators to become the "victims of formulae." No learning, he said, is of permanent value which does not involve the self-activity of the individual. Health is the basis of happiness, and usefulness; but a mere knowledge of its laws will not insure it. Everybody carries within himself the forms in accordance with which he can be happy. Culture grows out of one's nature; it is indigenous, not a graft; thus every people should make the most of its vernacular; thus, too, wars of conquest are incompatible with human welfare, the national glory resting on such a basis being a mockery.

All this suggests his influence among his own people; but it reached beyond these limits; in France Guizot, De Tocqueville, Renan, and Taine were indebted to him; and in England Burke, Carlyle, Darwin and Coleridge were also his disciples. These names link him to our times, such being the significance of all history,—the eliminating what has done its work and the passing on what still has vitality for the future.

The human side of Herder has been well brought out, which serves to emphasize his greatness, at the same time bringing him nearer to the reader: the melancholy which pervaded his life, the jealousy of his colleagues, the irksomeness of his official duties, his distress at Goethe's seeming neglect, his refusal to wear a wig for dignity's sake because his own hair was cheaper, his fear of being called to war, his finding nobody with whom he cared to associate or who cared to associate with him, his last days burdened by his blindness, with most of his friends alienated; but none of all this appears in his writings; and the words Life, Love, Light,

which are inscribed on his tombstone seem fitting words to commemorate this great preacher and teacher of humanity.

E. W. Flagg.

The school nurse. A survey of the duties and responsibilities of the nurse in the maintenance of health and physical perfection and the prevention of disease among school children. By Lina Rogers Struthers, R. N. New York, G. P. Putnam's Sons, 1917. 293 p.

The author states in the preface that this book is written for school nurses, "in the hope that it may contain suggestions and directions that will be of material assistance to them."

The first part is historical. It is pointed out that medical supervision of schools has passed through three phases. First, the child with a communicable disease was merely excluded from school, but there was nothing to keep him from mingling with the other children outside of school hours. With the advent of the school nurse, there came the policy of cure, and school attendance increased fifty per cent. At last has come the policy of prevention, with school clinics, instruction in hygiene, and other constructive measures. Her account of the difficulties under which the school nurse worked in the beginning of the movement is particularly interesting. In striking contrast with these is the present status of school nursing, which is given in detail, not only for the different cities in this country, but for the more important ones of Canada and Europe.

The heart of the book is the part devoted to the actual work of the school nurse. The organization of her work is the first problem and her programs must be so arranged that she can make regular visits to the different schools. In rural districts, three to six schools should be the maximum, and in cities the number of pupils under her care may vary from 500 to 2000. Detailed instructions are given for examining the children and treating the minor troubles, lists of which are given and remedies suggested. Teeth-washing and nose-blowing drills, outdoor classes and schools, the selection and care of the tooth brush, and many other such particular topics are discussed in a plain and simple but very detailed way. Even such details as the construction of the school medicine or supply cabinet and what it should contain are given. A complete chapter is devoted to the subject of Little Mothers' Classes, giving their history and an outline of how they should be organized and conducted.

Closely associated with the discussion of the nurse's work is the treatment of what might be called the legal aspects. For example she outlines the duties of the Board of Education and those of the Board of Health and explains which has jurisdiction in certain cases. The discussion is broadened out to include suggestions for legislation or local regulations and advice for forming committees and various boards.

A section on children's diseases is one of the longest in the book. Much of the information here is valuable and interesting, but one would think that a graduate nurse would hardly need a good portion of it—or if she did, she would certainly need more than could be given in a small book like this.

One chapter is devoted to the qualifications of the nurse herself, and emphasis is laid on the necessity of neatness in attire, and sympathy and persistence in her work, especially in the home visiting. She explains that there are many things outside of her regular line which the nurse should know and ends the chapter with a discussion of some of the more common questions of school hygiene.

Throughout the book there are very frequent references to the manner of making out card index reports and records and at the end several pages are devoted to showing blank forms for these purposes.

This book was written for nurses and some parts will not appeal to the educator. But there is much that is of value to him, and taken as a whole the work gives a very satisfactory knowledge of the subject of school nursing.

McKendree College. RAYMOND BELLAMY.

Der Weltkrieg 1914-15 in der Volksschule. By FRANZISKA PEIL. Paderborn, Ferdinand Schöningh, 1915. 108 p.

In the third edition of this little book designed for instruction in the Peoples Schools the author gives an account of the causes of the great war and also a history of the war for the months of July, August, September and October; and this third edition is further improved, in the opinion of the author, by a thorough elimination of foreign words. Besides this are added sections on the war in instruction in the different subjects—religon, German, history, geography, and the rest.

It seems a pity that the German youth should lose the rich humor of this textbook. The author states the deeper causes of the war in rather moderate fashion, but the special humor of the production lies in the account of the battles of the war, which one suspects is naïve quite as much as mendacious.

Several pages are devoted to the conquest of Belgium, then the statement is made that on the 4th of September Rheims fell into the hands of the Germans without battle because evacuated by its garrison. The author gives the description of the epoch making events of the next week as follows: "Unmolested our army passed over the Marne. Here finally it fell upon the enemy. At the line of the Meaux-Vitry (Sept. 10) violent stubborn fighting occurred. The left wing of the French army endeavored to surround our right wing. Then the latter was bent back. The line of battle was now transferred to the Aisne. (Thus Rheims came again into the possession of the French.) Here the Germans established tremendous earth fortifications."

Such is the remarkable description of the great epoch making battle of the Marne, when Germany was driven back and thoroughly defeated, lost perhaps 150,000 men, and gave up eight of the eleven departments of France invaded by her armies. The author caps the climax by his résumé of the great events of the war which is in part as follows:

Aug. 26. The fall of Namur.

Aug. 27. Great defeat of the French and Belgian troops near Namur.

Sept. 28. The first attacks on the outer forts of Antwerp occurred.

This amazing summary is only equaled by the map showing the position of the German troops during the period of this French invasion. On the 10th of September, the day on which the Germans were thoroughly defeated, their battle line is represented as nearer to Paris than ever before. Certainly it would be difficult in the best pages of *Fliegende Blätter* to find anything more humorous than this. W. H. B.

BOOK NOTES

The exceptional child. By MAXIMILIAN P. E. GROSZMANN. New York, Charles Scribner's Sons (c. 1917). 764 p.

The author uses the term "exceptional" in the broadeest sense, and after the usual preliminary chapter on The Educational Problem in General, takes up in successive chapters, Efficiency, Different Civilization Levels in Modern Society, Classification and Terminology, Normal and Potentially Normal Children, Exceptionally Bright Children, Psychopathic Disorders and Psychopathic Constitutions, The Feeble-Minded Group, Juvenile Delinquency, and Sexual Perversion and Prostitution. So much under The Problem of the Individual Child. In Part II, under The Problem of Clinical Research and Diagnosis, are treated The Determination of Exceptional Development in Children, Standardization, Binet Scale, Meaning of an Educational Clinic, and A Schedule of Tests. Part III deals with Prevention, Adjustment, and Organization, and under this, Legal Provisions for Exceptional Children, Eugenic Considerations, Marriage, and Heredity, Home Life and Education, School Problems, the Kindergarten Period, General Provisions for Variation from Type, Provisions for the Exceptional Child in School and Institutions, The Sanatorium Schools for Atypical Children, and Teacher-Training. In an appendix come The City and Her Boys, and A Medical Symposium. As will be seen from this outline, the work is extensive and valuable. The author has done well to bring together the results of his own study and experience in this systematic form. Our criticism would be that there is too much in it that pertains to his own institution and methods, and too little account of what is being done elsewhere. It is singular, too, that in his bibliography of over twenty pages he has drawn on almost nothing but English sources, when so much and excellent work has been done in Europe.

Fifty years of American education; a sketch of the progress of education in the United States from 1867 to 1917. By ERNEST CARROLL MOORE. Boston, Ginn and Co. (c. 1917). 96 p.

The three chapters are entitled. We Live in a Period of Change; Education to the End of the Civil War; and, Some Changes since the Civil War. There is a brief bibliography of some fifteen titles appended. It is a pity that with the data available we could not have had something that comes down more to recent times. Some readers will be struck with the remark about "John Dewey's discovery that real education is and must be based upon the nature of the child." How can this be called a "discovery" when it goes back to Froebel, Rousseau, Pestalozzi, not to say to Comenius; and valuable as Dewey's work is, what did he do toward this "discovery"? The impression that this book makes is that it was written as a kind of perfunctory "job," especially Chapter three. There is a great opportunity for a splendid piece of work here but this author has certainly sidestepped it, and his bibliography suggests that he is not acquainted with the best literature upon the subject, particularly, again, in the third chapter.

The teaching of economics in Harvard University; a report presented by the Division of Education at the request of the Department of Economics. Cambridge, Harvard University Press, 1917. 248 p.

This is the complete report presented to the department of Economics and the President in September, 1916. It has been somewhat revised and is published with the conviction that its problems and methods and conclusions are of interest to college teachers not only of Economics but of other subjects outside of Harvard. It is signed by Professors Hanus, Johnson, Moore, Dearborn, Inglis, Brewer, and Holmes. It deals with the inspection as a whole, aims in the teaching of economics, quantitative studies from students' records—studies in correlation. minor studies and proposals for experiments, the questionnaire method, marking, summary of conclusions and recommendations, and supplements.

Neurosyphilis; modern systematic diagnosis and treatment. By E. E. Southard and H. C. Solomon. Boston, W. M. Leonard, 1917. 496 p.

This book presents the subject of diagnosis and treatment of neurosyphilis in the form of one hundred and thirty-seven case histories. It is written primarily for the general practitioner and at the end has a chapter entitled "Summary and Key." Fourteen of these cases are selected from British, French, and German writers, to illustrate the war. The lessons of the book are summed up in three propositions: 1. the unity in variety of the phenomena of the diseases; 2. the value of hopeful approach to all, even the paretic forms; and 3. the value of applying syphilitic tests to every case of neurosis or psychosis.

A theology for the social gospel. By Walter Rauschenbusch. New York, Macmillan Company, 1917. 279 p.

This is an elaboration of the author's lectures in April, 1917, on the Taylor Foundation at the Yale School of Religion, which lectures are supposed to deal with some theme in doctrinal theology, so the author opens up with a challenge of the social gospel to theology, and then treats of the difficulties of theological readjustment, tells us that it is something neither alien nor novel, deals with the consciousness of sin, the fall of man, the nature and transmission of sin, the superpersonal forces of evil, its kingdom, the social gospel and personal salvation, and that of the superpersonal forces, their relation to the church, the kingdom of God and its initiator, the relation of the social gospel to the idea of God, Holy Spirit, revelation, inspiration and prophecy, baptism, and the Lord's Supper, eschatology, the atonement.

A parent's job. By Columbus N. Millard. Boston, Pilgrim Press, (c. 1917). 227 p.

The chapter headings in this book are as follows: Slipping Responsibility on the Schools; Displacing the Idol of Percentages; Habits of Address that Home and School Should Co-operate to Form; Habits of Work that are Essential to Efficiency; Some Essential Habits of Character; Health Habits that Are Vital to Efficient Living; Home Education Prior to Entering School; The First Three Grades of School; Home Co-operation in the Fourth, Fifth and Sixth Years of School; Co-operation in the Seventh and Eighth Grades, and in First Year High School; National Preparedness.

Religious education and American democracy. By WALTER SCOTT ATHEARN. Boston, Pilgrim Press (c. 1917). 394 p.

To make the world safe for democracy demands intelligence and Godliness. The first chapter outlines the system of public schools which the state is building and also a system which the author believes the church should build if intelligence is to be complemented with Godliness. The attempt is to develop a constructive program of religious education for the American people, to analyze existing agencies, to determine our present assets and liabilities, and to survey available literature. The writer believes our great problem is to develop such a course.

Nnmenius of Apamea, the father of Neo-Platonism; works, biography, message, sources, and influence. By KENNETH SYLVAN GUTHRIE. Grantwood, N. J., Comparative Literature Press, (c. 1917). 215 p.

This is a scholarly work, first giving an account of the author's treatise on the good, including practical questions, theological metaphysics and allegoric exposition by comparative religion. The fourth book is no longer extant. Then follow, in successive books, philosophical theology, spiritual interpretations, the mystery-teachings of Plato, the Hoppoe, the bird of prognostication, the indestructibility of the soul, space, number, Timeaeus, and history of the successors of Plato.

Kinderstudie; Paedologische Bladen. November, 1917. Vol. II, No. 2.

This journal devotes five pages to the article by L. C. Day, entitled "A Small Boy's Newspapers and the Evolution of a Social Conscience (Pedagogical Seminary, June, 1917, Vol. 24, No. 2); nearly five more to the same author's "The Child God" (Pedagogical Seminary, September, 1914, Vol. 21, No. 3); two pages to his "Alphabet Friendships" (Pedagogical Seminary, September, 1914, Vol. 21, No. 3); and five and a half pages to J. K. Folsom's "The Scientific Play World of a Child" (Pedagogical Seminary, June, 1915, Vol. 22, No. 2).

Handicaps of childhood. By H. ADDINGTON BRUCE. New York, Dodd, Mead and Co., 1917. 310 p.

This is partly a reprint of articles printed in magazines, but they are interesting and it is well to have them printed together. The ten topics and chapters are as follows: Mental Backwardness; The Only Child; The Child Who Sulks; Jealousy; Selfishness; Bashfulness and Indecision; Stammering; Fairy Tales That Handicap; "Night Terrors"; In Conclusion.

Education according to some modern masters. By CHARLES FRANKLIN THWING. New York, Platt and Peck Co. (c. 1916). 296 p.

This book consists of lectures on Emerson, Carlyle, Ruskin, Stuart Mill, Gladstone, Arnold, J. H. Newman and Goethe, with a summary and conclusions.

The seven laws of teaching. By JOHN M. GREGORY. New edition. Revised by William C. Bagley and Warren K. Layton. Boston, Pilgrim Press (c. 1917). 129 p.

There is the law of the teacher, the learner, the language, the lesson, the teaching process, the learning process, and of the review and application; these are the chapter headings.

Bugle calls of liberty; our national reader of patriotism. By GERTRUDE VAN DUYN SOUTHWORTH AND PAUL MAYO PAINE. Syracuse, Iroquois Pub. Co., (c. 1917). 179 p.

This is an admirable selection of some thirty articles or orations by prominent men, bearing on patriotism, Patrick Henry, Paul Revere's ride, the Declaration of Independence, the Liberty Bell, America, Lincoln's Gettysburg address, Barbara Frietchie, down to Wilson's message, with the Constitution of the United States as an appendix. The book is illustrated with some two dozen cuts.

American patriotic prose. By AUGUSTUS WHITE LONG. Boston, D. C. Heath and Co. (c. 1917). 389 p.

This is a book of selections on ten topics, such as The Streams of American Life, The Colonies, Independence Developed, The Declaration, Washington, Struggle and Growth, Division and Reunion, Gallant Youth, Responsibility, and Opportunity.

The use of motives in teaching morals and religion. By THOMAS WALTON GALLOWAY. Boston, Pilgrim Press (c. 1917). 187 p.

This treats educational methods in religious education, some principles applied in general which must be applied in religious education, essential natural elements, principle of motivation, study of natural motives, form of expressive work suitable to Sunday Schools, etc.

Stories for any day. By CAROLYN SHERWIN BAILEY. Boston, Pilgrim Press, (c. 1917). 163 p.

This book assumes that the story every child loves best is one about family life, and so these tales are based upon true incidents that have been told countless times. They are brief and are said to offer new material of interest and ethical value. There are some thirty-five of these tales.

Beginning Latin Book. By ALBERT S. PERKINS. Chicago, Benj. H. Sanborn and Co., (c. 1918). 432 p.

This book is based on the idea that Latin originals should be correlated with English derivatives; correlation with written matter is given, and there is practice in the direct method. One excellent feature of the book is the many illustrations it contains. There are references not only to literature but three Latin songs are printed.

Spontaneous activity in education. By MARIA MONTESSORI. Tr. from the Italian by Florence Simmonds. New York, Frederick A. Stokes Co., (c. 1917). 355 p.

This is a very valuable work, and every teacher will be glad to see it in English dress. The chapter headings are, A Survey of the Child's Life, A Survey of Modern Education, My Contribution to Experimental Science, The Preparation of the Teacher, Environment, Attention, Will, Intelligence, and Imagination.

The Montessori elementary material. By MARIA MONTESSORI. Tr. from the Italian by Arthur Livingston. New York, Frederick A. Stokes Co., (c. 1917). 464 p.

This book describes the Montessori conclusions in regard to the teaching of grammar, reading, arithmetic, geometry, drawing, music, and metrics.

The University of the State of New York prints five little booklets under the general term of Higher Education, devoted to the following topics: Medicine; Chiropody; Veterinary Medicine and Surgery; Certified Public Accountants; Certified Shorthand Reporters. They are essentially law books.

Studies in higher education in Ireland and Wales, with suggestions for universities and colleges in the United States. By GEORGE EDWIN MACLEAN. Bureau of Education Bulletin, 1917, No. 15. Washington, Government Printing Office, 1917. 118 p.

Report of a survey of the University of Nevada. Bureau of Education Bulletin, 1917, No. 19. Washington, Government Printing Office, 1917. 184 p.

Practice teaching for teachers in secondary schools. Bureau of Education Bulletin, 1917, No. 29. Washington, Government Printing Office, 1917. 82 p.

A study of organization and method of the course of study in agriculture in secondary schools. By THEODORE HILDRETH EATON. New York, Teachers College, 1917. 183 p.

The organization of instruction materials, with special relation to the elementary school curriculum. By J. W. HECKERT. New York, Teachers College, 1917. 107 p.

NOTICE TO READERS

Until the close of the war, the size of the PEDAGOGICAL SEMINARY will be reduced twenty or twenty-five pages per number, making a volume of about five hundred pages.